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Computer Programming with JAVA Java JumpStart: A Hands-on Training from Basics to Building Blocks

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Abstract– This community service activity represents a collaborative effort between the College of Science and Technology, Guimaras State University, Philippines, and the Computer Science, Universitas Pakuan, Indonesia. The initiative was designed to support the Sustainable Development Goals (SDGs), specifically SDG 4: Quality Education, SDG 8: Decent Work and Economic Growth, SDG 9: Industry, Innovation, and Infrastructure, SDG 10: Reduced Inequalities, and SDG 17: Partnerships for the Goals. The primary objective of this program was to equip participants with foundational knowledge and practical skills in Java programming, fostering digital literacy, critical thinking, and problem-solving abilities essential for personal and professional growth in an increasingly technology-driven world. The expected outputs of the activity included equipping participants with a solid understanding of Java basics, enabling them to create simple Java applications independently, use integrated development environments (IDEs) like Eclipse or NetBeans effectively, and develop enhanced problem-solving skills through programming exercises. Participants were also introduced to foundational object-oriented programming concepts such as classes, objects, inheritance, and polymorphism, culminating in the creation of a functional project that integrates key Java programming concepts. Additionally, teachers gained the confidence and skills to incorporate Java programming into their classrooms or workshops, ensuring the program's long-term impact. The program demonstrated significant outcomes, as evidenced by the data in Table 3, where the average participant understanding exceeded 90%. This notable achievement underscores the success of the initiative in promoting knowledge transfer and skill development. Furthermore, it highlights the effective collaboration between Guimaras State University and Universitas Pakuan in advancing the tri dharma of higher education: teaching, research, and community service while delivering tangible benefits to the community. This success encourages both institutions to continue fostering partnerships that contribute to sustainable development and societal well-being.
Keywords: Java Programming; Digital Literacy; Sustainable Development Goals (SDGs); Community Service; Collaborative Education.

1. INTRODUCTION

Guimaras State University is dedicated to delivering quality education and extending its influence to the community through capacity-building initiatives, innovation, and skill development. By offering hands-on training in Java programming, the university can fulfill its role in promoting knowledge transfer and technological proficiency among students, educators, and industry partners. In today's rapidly evolving technological landscape, there is a growing demand for individuals skilled in programming and software development. Java remains a critical programming language used across various industries due to its versatility, widespread adoption, and object-oriented features(Lincopinis et al., n.d.)(Abdulkareem Hamaamin et al., 2024).

The Schools Division of Guimaras likely identified the following challenges and gaps such as limited programming and technical skills among teachers and learners, limited access to programming courses and resources, shortage of teachers with programming expertise which could affect students' exposure to computer science and technology subjects, and lack of hands-on training opportunities in programming. Also, many learners and teachers lack access to

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quality training and practical applications in this field, making it difficult to compete at a regional or national level(Pengentasan Kemiskinan et al., n.d.).

With this notable gaps, the College of Science and Technology and Universitas Pakuan (UNPAK), Bogor, Indonesia prompted the development of the extension activity titled "Java Jumpstart: A Hands-on Training from Basics to Building Blocks". The Java Jumpstart training aims to bridge this gap by providing participants with a foundational understanding of Java and practical(Nordin, 2021), hands-on experience. Faculty members from UNPAK and CST will serve as resource persons. By engaging faculty members from UNPAK, GSU can offer participants a more diverse and well-rounded learning experience.

The Sustainable Development Goals (SDGs)(Sorooshian, 2024) are a global agenda adopted by the United Nations (UN) in 2015. This agenda encompasses 17 main goals, broken down into 169 specific targets. The SDGs aim to create a fairer, more peaceful, and sustainable world by 2030. It serves as a strategic framework to address global challenges such as poverty, inequality, climate change, and sustainable development, engaging all nations in a collective effort (United Nation, 2025).

Figure 1. Sustainable Development Goals (SDG's)

The extension activity is closely aligned with several United Nations Sustainable Development Goals (SDGs), namely SDG 4: Quality Education, SDG 8: Decent Work and Economic Growth, SDG 9: Industry, Innovation, and Infrastructure(Holroyd, 2022) (Putra et al., 2022), SDG 10: Reduced Inequalities (Küfeoğlu, 2022) and SDG 17: Partnerships (Dada, et.al, 2022) for the Goals.

2. IMPLEMENTATION METHOD

This community service activity was conducted in several stages of delivery methods that had previously been planned and coordinated between the Resource Person from Computer Science FMIPA Pakuan University and Computer Science and Technology from Guimaras State University.

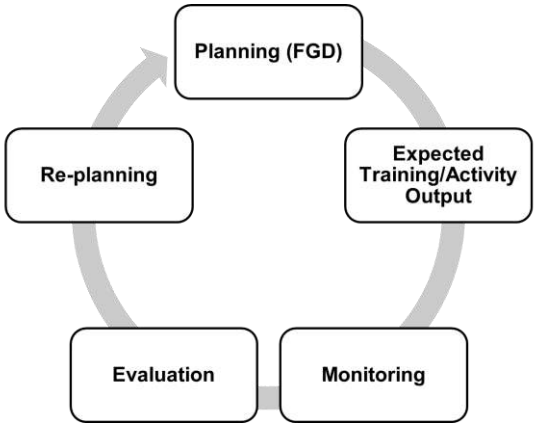

Figure 2. Community Service JumpStart Method

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This planning and coordination are expected to produce an effective method of learning delivery in a short time. Here are the methods generated from the Forum Group Discussion.

2.1 Planning(Forum Group Discussion)

At this stage, the main focus is the forum group discussion to determine the speakers and trainers, delivery techniques and outputs of this service, here are the points retrieved from the planning stage.

a. Meeting with the Schools Division Superintendent of Guimaras, Universitas Pakuan (UNPAK) and the CST Faculty Members.
b. Conduct a Needs Assessment survey to identify the target audience, their knowledge levels, and specific areas of interest or concern related to Java.
c. Develop a comprehensive agenda and content structure based on the identified needs, incorporating a mix of presentations, and interactive sessions.
d. Tapped the Universitas Pakuan (UNPAK) for the resource persons.
e. Allows speakers to deliver presentations on specific topics, providing in-depth insights and practical examples.
f. Participants will engage in hands-on practice and coding exercises.
g. Evaluate the overall success of the community extension activity based on the defined objectives.
h. Gather feedback from participants, trainers, and any stakeholders involved.

2.2 Expected Training/Activity Output

a. Participants will have a solid understanding of Java programming basics, including syntax, data types, control structures, and basic object-oriented programming (OOP)
b. Participants will be able to independently create simple Java applications, demonstrating the ability to write, compile, and run Java code.
c. Participants will gain experience in using Java development environments (IDEs) such as Eclipse or NetBeans for coding and debugging.
d. Participants will develop enhanced problem-solving and logical thinking skills through Java programming exercises.
e. Participants will gain a foundational understanding of object-oriented programming, including concepts such as classes, objects, inheritance, polymorphism, and methods.
f. Participants will apply the knowledge gained throughout the training to develop a functional project that integrates key Java concepts.
g. Participants will demonstrate an increase in their overall digital literacy, particularly in programming and using Java for various tasks.
h. Teachers will have gained the skills and confidence to introduce basic Java programming concepts into their own classrooms or workshops.
i. Participants will continue learning Java and improving their programming skills through post-training support, resources, and community engagement.

Table 1. Java Jumpstart Objectives

General Objective	Specific Objectives
To equip participants with foundational knowledge and practical skills in Java programming, fostering digital	a) To introduce participants to the basics of Java programming, including syntax, data types, and control structures, providing a foundational understanding of the language. b) To develop participants' problem-solving and logical thinking skills through hands-on coding exercises and real-world programming examples.

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literacy, critical thinking, and problem-solving abilities essential for personal and professional development in the evolving technological landscape.	c) To enable participants to create, compile, and run Java programs independently, fostering confidence and self-sufficiency in coding. d) To familiarize participants with basic object-oriented programming (OOP) concepts such as classes, objects, and methods, establishing a basis for advanced Java topics. e) To enhance digital literacy among participants by integrating Java programming skills with broader ICT competencies relevant to academic and professional contexts. f) To provide teachers with the skills and resources to integrate introductory programming concepts into their own classrooms, supporting future ICT and STEM initiatives. g) To assess participants' understanding and application of Java fundamentals through practical exercises and projects, ensuring skill retention and competency.

2.3 Monitoring, Evaluation and Re-Planning

Monitoring, Evaluation, and Re-planning are crucial components of any community extension activity to ensure its effectiveness and continuous improvement. To monitor and evaluate the progress of the project, we will develop a plan that will include post-assessment surveys, focus group discussions, and regular review meetings (virtual, hybrid, or in-person) with the participants of the Schools Division of Guimaras. Focus group discussions will be conducted to gain feedback on the program's effectiveness, and we will hold regular review meetings to track progress toward our objectives.

3. RESULTS AND DISCUSSION

The community service organized by the College of Science and Technology Guimaras State University and Computer Science University of Pakuan with the theme "Java JumpStart: A Hands-on Training from Basics to Building Blocks" was held on November 18-22, 2024 via Hybrid GSU Multimedia Center and Zoom Meeting.

Figure 3. Banner Collaboration

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The following is the activity plan for November 18-22, 2024 with details of the content that has been mutually agreed upon in the planning of the forum group discussion.

Table 2. Content of the Training/Activity

Date	Content	Duration
November 18, 2024	**Day 1: Introduction to Java** a) What is Java? b) Setting up the development environment. c) Basic syntax: variables, data types, operators Input and output.	8 hours
November 19, 2024	**Day 2: Control Flow** a) Decision making: if-else statements. b) Looping: for, while, do-while loops.	8 hours
November 20, 2024	**Day 3: Arrays and Strings** a) Arrays: declaration, initialization, access. b) Strings: manipulation, methods.	8 hours
November 21, 2024	**Day 4: Object-Oriented Programming (OOP)** a) Classes and objects. b) Encapsulation Methods.	8 hours
November 22, 2024	**Day 5: Exception Handling and File I/O** a) Exception handling: try-catch-finally. b) File I/O: reading and writing files.	8 hours

Socialization was conducted to participants to provide direction, delivery methods and java learning which will be carried out during November 18-22, 2024.



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Figure 4. Socialization JumpStart

The Community Extension Services Project, initiated by Guimaras State University, Philippines (GSU) in collaboration with Universitas Pakuan, Indonesia (UNPAK) as a partner university, will take place from November 18–22, 2024. This event will be conducted in a hybrid format, with on-site sessions held at the GSU Multimedia Center and online sessions accessible via Zoom. The program aims to provide in-depth insights and training on Java programming, focusing on enhancing participants' technical skills in software development. The event will feature expert speakers from both institutions, including Adrian J. Forca, MIT (GSU, Philippines), Gustian Rama Putra, M.MSI, Dinar Munggaran Akhmad, M.Kom., and Muhammad Ghifari (UNPAK, Indonesia). Participants can join the program using Meeting ID: 895 1080 1246 and Passcode: JAVA2024.

The program is designed to deliver a structured learning experience. It begins with a pre-test to assess participants' initial competencies, followed by a series of intensive learning sessions and training. These sessions include the development of a Java application project to apply the concepts learned during the training. At the end of the program, participants will take a post-test to evaluate their progress in understanding and applying Java programming skills. This approach ensures that participants not only gain theoretical knowledge but also develop practical expertise in Java-based software development. The program is open to students, academics, and professionals interested in deepening their knowledge of Java programming and advancing their skills in information technology.

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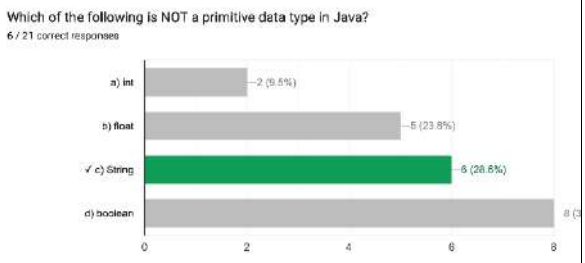
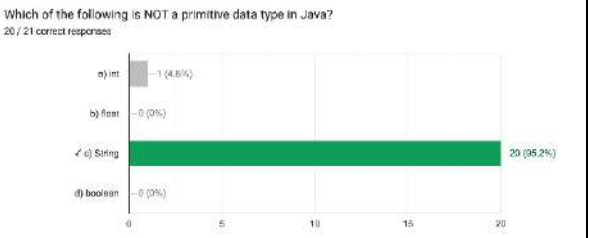
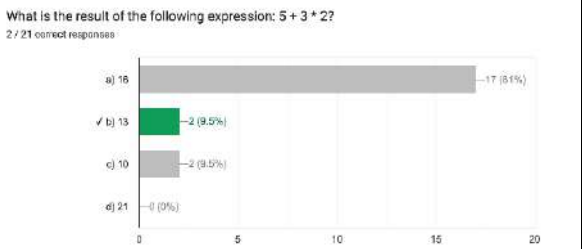
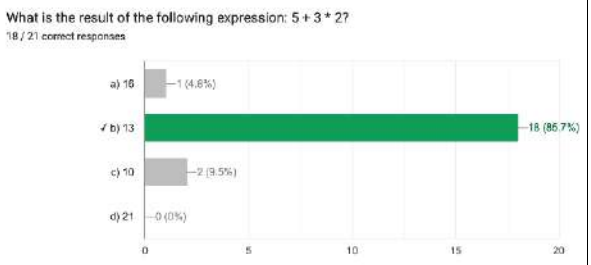
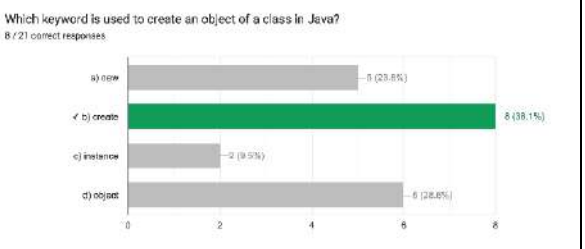
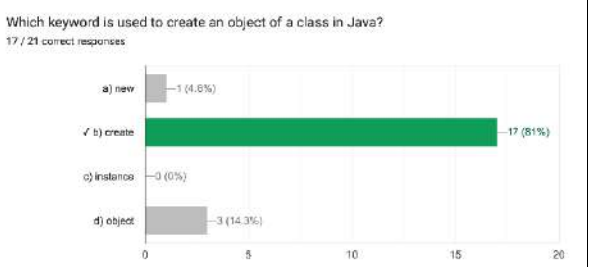
Figure 5. Project Sessions

The project session is the final project implementation stage given by resource persons from Guimaras State University and Pakuan University to monitor the results of learning delivery during this jumpstart activity. The purpose of this service is a competency value of the participants in understanding making simple applications using the java programming language. The following are the results of the evaluation of the implementation of this service activity through the results of assessments and questionnaires from participants:

Table 3. Comparison of Result

Before	After
	
	
	

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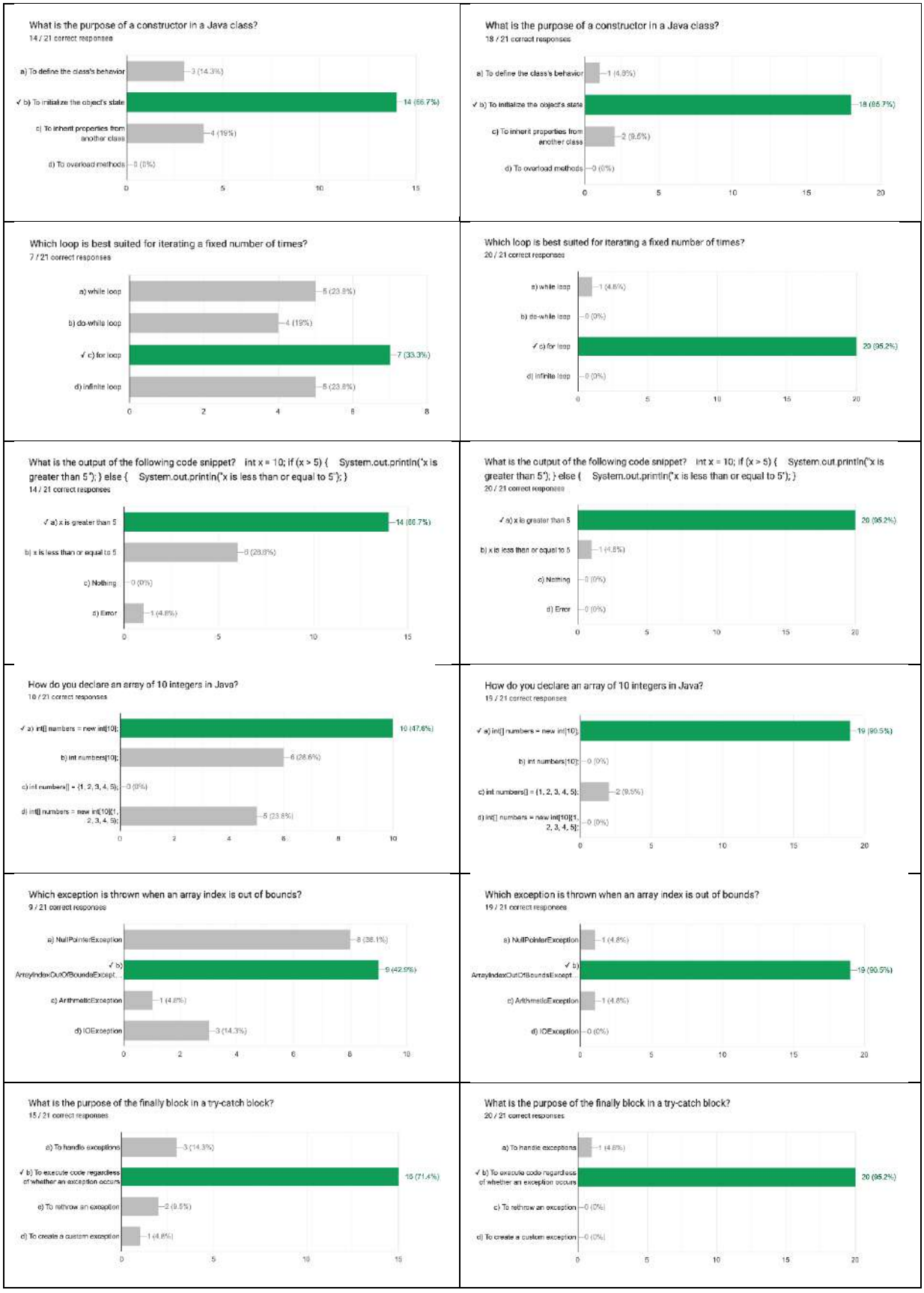

Based on the comparison table of the level of understanding of participants before participating in community service activities with the theme "Java JumpStart: A Hands-on

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Training from Basics to Building Blocks", it was found that the graph results increased significantly from the assessment table after participants participated in this activity. This answers that this activity can help the program of the sustainable development goals (SDG's) that have been planned in this community service activity.

4. CONCLUSION

This community service activity is a collaboration between the College of Science and Technology from Guimras State University, Philippines and Computer Science from Pakuan University, Indonesia. This community service was initiated to support the sustainable development goals (SDG's) at the SDG 4: Quality Education, SDG 8: Decent Work and Economic Growth, SDG 9: Industry, Innovation, and Infrastructure, SDG 10: Reduced Inequalities and DG 17: Partnerships for the Goals.

The general purpose of this activity is to provide participants with foundational knowledge and practical skills in Java programming, fostering digital literacy, critical thinking, and problem-solving abilities essential for personal and professional development in the evolving technological landscape has significant development results have been seen in Table 3 where the average understanding of participants is >90%. This achievement is a very good thing for both Guimaras State University and Pakuan University to continue to collaborate in the implementation of the tri dharma of higher education that is beneficial to the community.

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