**Level of Adaptability in Java Programming Language**

**For Second Year BSIT of CDSCDB**

Researchers:

Almario, Adreil  
Almario, Andrei  
Almario, Carl  
Azcarrate, Radcliffe  
Flores, Jhunguide

Institution:   
Colegio De Santo Cristo De Burgos

Date: July 2024

**Context and Rationale**

This research titled “Level of Adaptability in Java Programming Language for Second Year BSIT Students of Colegio De Santo Cristo De Burgos” this focuses on assessing how well second-year Bachelor of Science in Information Technology(BSIT) students of Colegio De Santo Cristo De Burgos(CDSCDB) adapt to learning ang using the Java Programming Language. This study aims to identify the factors that influence their adaptability, the challenge they face, and the strategies that can enhance their learning experience and proficiency in Java programming.  
  
 The field of Information Technology is constantly evolving, and programming skills are fundamental for IT students. Java, being one of the most popular and widely-used programming languages, is essential for various applications, from web development to mobile applications and enterprise systems. Understanding how well students learn Java helps us make better teaching tools to support them.  
  
 This research seeks to provide insights into the current state of Java programming education among second-year BSIT students at CDSCDB. By identifying the strengths and weakness in their learning process, the study aims to contribute to the improvement of the curriculum and way of teaching.

This will help produce graduates who are skilled in Java and a can easily adapt to other programming languages and technologies, making them more competitive in the job market.  
  
**Specific Problems**

This study aims to determine the level of adaptability to Java programming language among second-year Bachelor of Science in Information Technology (BSIT) students at Colegio de Santo Cristo de Burgos (CDSCDB). The following questions guide this research:

1. What is the level of Java programming adaptability among second-year BSIT students at CDSCDB?
2. What factors influence the adaptability to Java programming language in these students?
3. How do the challenges faced by second-year BSIT students correlate with their adaptability to Java programming language?

**Specific Objectives**

The researchers’ objectives in this study is to know the knowledge level and comfortability of 2nd year BSIT students in Java programming. This study also aims to provide insights into how well students can adjust to various aspects of Java programming, including syntax, object-oriented principles, and collaborative coding practices. Additionally, the researchers aim to achieve the following:

1. Assessing Proficiency in Java Syntax and Concepts.
2. Evaluating Problem-Solving Skills Using Java.
3. Knowing how to implement Object-Oriented Programming (OOP) Principles.

**Participants and/or other Sources of Data and Information**

This study was conducted to know the level of adaptability in Java Programming Language along with twenty-four (24) participants from the BSIT 2nd year students at CDSCDB as their survey respondents. It is expected to be useful to the following:

**To the students -** Who are expected to have a foundational understanding of programming this may help them further improve their knowledge about advance topics like Java programming.

**To the instructors -** They can provide more insights about the curriculum, teaching methods, and common challenges faced by students learning Java programming.

**Data Gathering method**

For this study, data was collected using a survey questionnaire designed as a Likert Scale Questionnaire. The survey was administered to second-year college students at Colegio de Santo Cristo de Burgos (CDSCDB) who are enrolled in Bachelor of Science in Information Technology (BSIT). The instrument focused on assessing the adaptability level of these students in learning the Java programming language, aiming to understand their experiences and the impact of Java proficiency on their learning outcomes. The Likert Scale Questionnaire employed in this study consisted of structured statements designed to gauge students' perceptions and experiences related to Java programming. Participants were asked to rate their agreement or disagreement with statements regarding their current proficiency in Java and challenges faced in learning the language.

The research design chosen for this study is cross-sectional. This design was selected because it allows for the collection of data at a single point in time from a specific group of participants which is the second-year BSIT students at CDSCDB. A cross-sectional approach is suitable for exploring the current state of students' adaptability to Java programming and understanding the factors influencing their learning experiences within a defined timeframe. It provides a snapshot of students' perceptions and proficiency levels, offering a comprehensive view that can inform immediate educational interventions and curriculum adjustments.

**Data Analysis**  
 The researcher used Spearman’s rank correlation coefficient (Spearman’s Rho) to determine if there is correlation between adaptability to Java programming and the challenges faced by second-year BSIT students.

The following are the average score of adaptability to Java programming (X) and the challenges faced by second-year BSIT students (Y). Below is the summary table:

|  |  |  |
| --- | --- | --- |
| **Student** | **Adaptability** | **Challenges** |
| A | 2 | 3 |
| B | 3 | 3 |
| C | 2 | 3 |
| D | 2 | 4 |
| E | 2 | 4 |
| F | 1 | 4 |
| G | 3 | 3 |
| H | 1 | 3 |
| I | 3 | 3 |
| J | 3 | 3 |

**Problem:** At 0.05 significance level, can we conclude that there is a significant correlation between level of java programming adaptability and the challenges faced by second-year BSIT students?

**Step 1: Construct the Null and Alternative Hypothesis.**

**Ho:** *rs* = 0 (There is no correlation between the adaptability to Java programming and the challenges faced by second-year BSIT students at CDSCDB.)

**Ha:** *rs* ≠ 0 (There is a correlation between the adaptability to Java programming and the challenges faced by second-year BSIT students at CDSCDB.)

**Step 2: State the level of significance.**

*L* = 0.05

**Step 3: Calculate the degrees of freedom(*df = N - 2*) and determine the critical value of t or *tcritical*.**

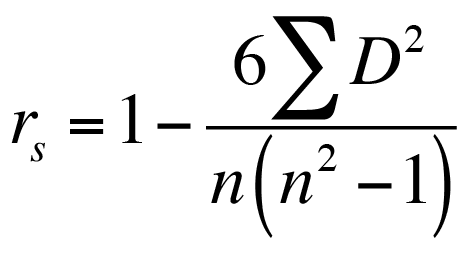
*df* = N – 2 *tcrit* = 2.306

= 10 - 2

= 8

**Step 4: Compute for the value of Spearman rho or *rs*.**

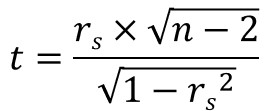
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Student** | **Adaptability**  **(x)** | **Challenges**  **(y)** | **Rx** | **Ry** | **D** | **D^2** |
| A | 2 | 3 | 3 | 2 | 1 | 1 |
| B | 3 | 3 | 2 | 2 | 0 | 0 |
| C | 2 | 3 | 3 | 2 | 1 | 1 |
| D | 2 | 4 | 3 | 1 | 2 | 4 |
| E | 2 | 4 | 3 | 1 | 2 | 4 |
| F | 1 | 4 | 4 | 1 | 3 | 9 |
| G | 3 | 3 | 2 | 2 | 0 | 0 |
| H | 1 | 3 | 4 | 2 | 2 | 4 |
| I | 3 | 3 | 2 | 2 | 0 | 0 |
| J | 3 | 3 | 2 | 2 | 0 | 0 |



*rs*

*rs* = 0.86

**Step 5: Calculate the tvalue then determine the decision.**



tvalue =

tvalue= 4.77

tvalue tcritical

4.77 > 2.306

|  |  |
| --- | --- |
| **If…** | **Then the decision is…** |
| tvalue < tcritical | Do not reject null Ho (Null Hypothesis) |
| tvalue ≥ tcritical | Reject the Ho (Null Hypothesis) |

**Ho:** *rs* = 0 (There is no correlation between the adaptability to Java programming and the challenges faced by second-year BSIT students at CDSCDB.) **X**

**Ha**: *rs* ≠ 0 (There is a correlation between the adaptability to Java programming and the challenges faced by second-year BSIT students at CDSCDB.) **✓**

**Step 6: State the Conclusion.**

Answer the following questions:

**1. Is there a relationship between the two variables being tested?**

*rs* = 0.86

There is a significant relationship between the level of java programming adaptability and the challenges faced by second-year BSIT students?

**2. What degree is their relationship or correlation?**

The correlation/relationship is high positive correlation

**Conclusion**  
 This study looked at how well second-year BSIT students at Colegio De Santo Cristo De Burgos adapt to learning Java programming. Our analysis showed a strong positive correlation between the challenges students encounter and their adaptability to Java. In other words, students who face more difficulties tend to become more adaptable and skilled in Java.  
  
 Students demonstrate varying levels of experience in key Java concepts, including syntax and problem solving. This variation highlights the need for targeted support to ensure that all students develop a solid understanding of Java. Also, the research indicates that challenge face by students are linked to their ability to adapt and improve their Java skills. Lastly, understanding and implementing OOP principles are essentials for mastering Java, and students must be comfortable with these concepts to advance in their programming skills. This suggest that experiencing and overcoming difficulties can enhance student’s learning and adaptability.  
  
 In conclusion, while second-year BSIT students at CDSCDB face challenge in learning Java, these challenge contribute positively to their adaptability and skill development. By focusing on supportive teaching methods and encouraging regular practice, educators can helps students better manage these challenge and become more proficient in Java programming. This approach will better prepare students for their future careers in the IT field.

**Recommendation**  
 Based on the findings of this study on the level of adaptability in the Java programming language among 2nd-year BSIT students at CDSCDB, the following recommendations are proposed:

1. **For Students**, engage in regular practice sessions to reinforce Java programming concepts learned in class. Utilize online platforms, coding challenges, and personal projects to enhance practical skills. Explore supplementary learning resources such as tutorials and coding communities to deepen understanding and address specific challenges encountered in learning Java. Actively participate in classroom discussions, ask questions, and collaborate with peers to leverage collective learning experiences and improve Java proficiency.

2. **For Professors**, adapt teaching methods to accommodate diverse learning styles and pace of students. Incorporate interactive and practical sessions, code reviews, and real-world examples to enhance engagement and learning outcomes. Foster a supportive learning environment where students feel encouraged to experiment, make mistakes, and learn from them. Offer timely feedback and guidance to address specific challenges faced by students in mastering Java programming.

3. **For Future Researchers**, conduct longitudinal studies to track the progression of Java programming skills among students across different academic years. This will provide insights into the long-term impact of educational interventions on Java proficiency. Compare the effectiveness of different teaching methods in enhancing students' adaptability to Java programming. Consider factors such as student engagement, retention rates, and practical skill development.

**References**Almario, A., Almario, A., Almario, C., Azcarrate, R., & Flores, J. (2024). Survey on adaptability to Java programming language. Google Forms. Retrieved from https://docs.google.com/forms/d/1lYOZ\_TIMw7Fw1FM03QxOoSS4pWpwphTka4d5P77YNHo/viewform  
  
Scribbr. (n.d.). Data collection methods | Step-by-step guide & examples. Retrieved from https://www.scribbr.co.uk/research-methods/data-collection-guide/

SAGE Publications Inc. (n.d.). Data collection methods. Retrieved from https://www.sagepub.com/sites/default/files/upm-binaries/10985\_Chapter\_4.pdf

EcampusOntario. (n.d.). References – Research methods, data collection and ethics. Retrieved from https://ecampusontario.pressbooks.pub/researchmethodsandethics/chapter/references-10/  
  
Level of proficiency of BSIT students in basic programming. (2020). Retrieved from <https://www.researchgate.net/publication/346554352_LEVEL_OF_PROFICIENCY_OF_BSIT_STUDENTS_IN_BASIC_PROGRAMMING>