**Activity Title: Choosing and Applying the Right Software Process Model**

**Objective:**

Students will explore various software development process models (Waterfall, Agile, V-Model, Spiral, Iterative, Prototyping) and learn how to apply the most suitable model for different project scenarios. They will simulate the development process according to the chosen model and present their approach.

**Materials:**

- Pen and paper or digital tools (Google Docs/Sheets, etc.)

- Research material or notes on process models (Waterfall, Agile, V-Model, Spiral, Iterative, Prototyping)

- Whiteboard or projector for presentations (optional)

**Group Size:**

4-5 students per group, or individual work for smaller classes.

**Time Required:**

45 minutes (30 minutes for activity, 15 minutes for presentation and discussion)

**Activity Breakdown**

**Part 1: Scenario Selection (5 minutes)**

Each group will choose one of the following software development scenarios to work on. These scenarios represent different types of projects with specific challenges and needs.

**Project Scenarios:**

1. E-commerce website for a small business that needs to be fully operational in 6 months.

2. Mobile app for real-time traffic monitoring and navigation with frequent updates based on user feedback.

3. Healthcare management system for hospitals that requires strict regulatory compliance and accuracy.

4. Online gaming platform that supports multiplayer functionality and needs to quickly adapt to user trends.

5. Prototyping a new AI assistant that requires feedback from users before full development.

6. Enterprise resource planning (ERP) system for a medium-sized business requiring long-term maintenance and frequent risk evaluation.

7. A **banking system** requiring secure transaction processing and regulatory compliance.

8. A **mobile game** with rapidly evolving features and frequent updates based on user feedback.

9. A **medical records system** where accuracy and testing at every stage are crucial.

10. A **social media app** where speed to market and adapting to user preferences are priorities.

**Deliverable:** A brief description of the chosen project, including its goals and challenges.

**Part 2: Select a Process Model (10 minutes)**

Each group will select one of the six process models—Waterfall, Agile, V-Model, Spiral, Iterative, Prototyping—based on their project scenario. They will justify their choice by explaining how the selected process model fits the project’s characteristics.

**Process Models:**

1. **Waterfall:** Linear and sequential, with well-defined phases.

2. **Agile:** Iterative, flexible, and focused on rapid development with continuous user feedback.

3. **V-Model:** Verification and validation-centric model, emphasizing strict testing at every stage.

4. **Spiral:** Risk-driven approach with iterative cycles and continuous risk evaluation, ideal for high-risk projects.

5. **Iterative:** Cyclical model that allows repeating phases until a satisfactory version is achieved.

6. **Prototyping:** Focus on developing prototypes to understand and refine requirements before full development.

**Guiding Questions:**

- Does the project need continuous customer feedback or user involvement?

- Are there regulatory or compliance needs that require heavy testing?

- Is rapid development and frequent iteration necessary?

- How much flexibility is required for changes and updates during the process?

- Is the project high-risk, requiring repeated risk assessments?

**Deliverable:** Selection of a process model with a 2-3 sentence explanation of why it is appropriate for the project.

**Part 3: Simulate the Process (20 minutes)**

Students will outline how the selected process model will guide the software development process for their project. They will simulate the key phases or iterations of the development lifecycle according to the chosen model.

**Process Model Simulation Guidelines:**

- **Waterfall:** Describe the phases (requirements, design, implementation, testing, deployment) in linear order.

- **Agile:** Outline sprint cycles, daily standups, and feedback loops.

- **V-Model:** Pair each development phase with a corresponding testing phase (e.g., system design with system testing).

- **Spiral:** Define iterations that include risk analysis, followed by development, validation, and refinement.

- **Iterative:** Describe how the product evolves through repeated cycles of design, development, and testing.

- **Prototyping:** Define how prototypes will be developed, tested, and refined based on user feedback before final development.

**Deliverable:** A 5-7 step outline of the key phases/iterations of the process model for the project.

**Part 4: Presentation and Discussion (25 minutes)**

Each group will present:

1. The project they selected.

2. The process model they chose and why it is suitable.

3. How they will apply the model through key development phases.

**Discussion Questions:**

- Why did you choose this process model over others?

- What are the strengths and weaknesses of this model for your project?

- How does this model handle changes, risks, or feedback during the project lifecycle?

- Would another model also work for your project? Why or why not?