

Department of Information Technology  
Subject: Discrete Mathematics  
Class: SYBTech IT(2023-24)  
(Role play activity as a pedagogy technique)

**Objective:** The role play activity aimed to help Second year BTech IT students to understand the Handshaking Lemma in the context of graph theory, a key concept in Discrete Mathematics. The activity was designed to provide an interactive and practical demonstration of the lemma, emphasizing pedagogical strategies for enhancing comprehension and engagement.

- **Activity Overview:** Students participated in a role play activity where they acted out scenarios to illustrate the Handshaking Lemma, which states that in any graph, the sum of the degrees of all vertices is twice the number of edges. This lemma is fundamental in understanding the properties of graphs and networks.
- **Pedagogical Approach:** The activity was designed to:
  - **Visualize Abstract Concepts:** Transform abstract graph theory concepts into tangible experiences.
  - **Enhance Understanding through Participation:** Use active involvement to reinforce theoretical knowledge.
  - **Promote Collaborative Learning:** Encourage students to work together and discuss concepts.

**Steps followed:**

1. **Introduction:** I introduced the Handshaking Lemma, explaining its significance in graph theory and its mathematical implications.
2. **Role Assignment:** Students were divided into groups and assigned roles representing vertices and edges. Each student represented a vertex, and the connections between them were simulated as edges.
3. **Role Play Execution:**
  - Each student (vertex) shook hands with others according to their degree (number of edges connected to them).
  - The students counted the total number of handshakes (edges) and verified the Handshaking Lemma by calculating the sum of degrees and checking if it was twice the number of edges.
4. **Explanation:** After the role play, the students were facilitated a discussion to reflect on the activity, linking the hands-on experience to the theoretical concepts.

**Observations:**

- **Concept Visualization:** Students were able to physically see and experience the Handshaking Lemma in action, which made the abstract concept more concrete and understandable.

- **Active Engagement:** The interactive nature of the role play kept students engaged and fostered a deeper understanding of the lemma. The hands-on approach helped in retaining the concept better than traditional lecture methods.
- **Collaboration:** Working in groups encouraged discussion and collaborative problem-solving, reinforcing the students' grasp of the material through peer interaction.

**Photo taken during the activity:**



**Link of the video taken during the activity:**

[https://drive.google.com/file/d/1m7X2\\_gDKjsaRGO\\_f60wWg4usoaojiMGR/view?usp=drive\\_link](https://drive.google.com/file/d/1m7X2_gDKjsaRGO_f60wWg4usoaojiMGR/view?usp=drive_link)

**Conclusion:** The role play activity successfully demonstrated the Handshaking Lemma, making an abstract graph theory concept accessible and memorable. By engaging students in an interactive learning experience, the activity reinforced theoretical knowledge and highlighted effective pedagogical practices for teaching complex mathematical concepts.