**Assessment Activities Workflow:**

1. Students come to the classroom.
2. Lesson 1 starts
3. <learning in the classroom>
4. At the end of lesson1, teacher wants students to do Assessment activities in their MyWelcome application
5. To do so, teacher opens a software (Teacher Panel in VAC/WPM)
6. Teacher opens Assessment Activity section
7. Teacher enters the ID of Lesson. In this case, 1.
8. Teacher enters the time that will be given to do the assessment activities. E.g. 30 minutes.
9. Teacher selects TCNs who are in the classroom. In other words, teacher selects TCNs whose assessment activities will be enabled for the specified amount of time.
10. Teacher sends this information.
11. In the background, Teacher Panel sends this info in RDF format to the respective agents of selected TCNs.
12. The agents who receive this message, send a message to their respective MyWelcome applications to enable the assessment activities of the specified lesson for the specified amount of time.
13. MyWelcome application enables the specified assessment activities and TCNs who are selected by teacher, start solving them.
14. MyWelcome app computes the result of the activities either when TCN submits or when the specified time expires.
15. Once computed, MyWelcome app sends the Assessment\_Score and scores for each section (Reading, Listening, Grammar, and Vocabulary) to the respective agent.
16. Agent receives the scores and saves them into LAKR
17. Agent computes the Course\_Progress\_Level
18. Agent sends a notification to Teacher Panel telling that its TCN has finished the activities for lesson 1 in this case.

**Coordination Workflow:**

1. In order to get a grouping result for lesson 2, teacher needs to start the process. Teacher will most likely start the coordination process after all TCNs submit their Assessment activity scores for lesson 1 since Assessment Scores are important for grouping.
2. Teacher enters the following information:
   1. A list of TCNs who should be grouped. Teacher selects the TCNs.
   2. The ID of lesson to compute the grouping for. In this case, 2.
   3. (Optional) A range for the size of groups. E.g. 3-5 (min 3, max 5 in each group). By default, the range is 2-5.
3. In the background, Teacher Panel should make sure that all the selected agents are awake and running. To do so, it can get help from WPM. Meanwhile WPM can update the status of the selected agents to “In\_Coordination” for efficiency reasons. Otherwise, each of the selected agents will need to send a message to WPM to update their status.
4. In the background, Teacher panel sends a message to the agents of each of the selected TCNs. The message should include the following info:
   1. The list of selected agents.
   2. The ID of the lesson.
   3. The ID of an agent (from the selected list) who will act as Dedicated Agent.
   4. (Optional) Group size
5. Once agents receive the message from Teacher Panel, they send their personal information to the Dedicated Agent.
6. Dedicated agent accepts the Personal info of other agents.
7. Once all selected agents submit their Personal info, Dedicated Agent:
   1. Computes the possible Coalition Structures
   2. Broadcasts the corresponding coalitions and Complete Personal info to all selected agents.
8. Once an agent receives the coalitions and the Complete Personal Info from Dedicated agent,
   1. It computes the Utility values for each coalition
   2. And it sends those values back to Dedicated Agent
9. Once Dedicated Agent collects the utility values from all of the selected agents,
   1. It builds the CSGP
   2. And it runs the BOSS algorithm to find a solution.
10. Once Dedicated Agent computes the solution,
    1. (Optional) It can broadcast the solution to other selected agents.
    2. It sends the solution (rank list) to Teacher Panel.
    3. It informs WPM that “Coordination ended for the participating agents” such that WPM updates the status.
11. After receiving the result, teacher will need to approve it. She can select one of them from the rank list or modify.
12. Teacher sends the final result to the respective agents who were in coordination.
13. Upon receiving, agents save the result in the LAKR.
14. Agents don’t inform their TCNs about the result.
15. Teacher informs TCNs about the result in the next lesson.