Collaborative Learning using Music and Technology

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Session ID: 5579
Project Definition

- Motivation
  - Create a learning environment where majors and non-majors would need to collaborate for the successful completion of a project

- A Robot Dance
  - Two LEGO MINDSTORMS NXT robots will perform a dance routine that includes right and left turns, forward and backward movements, arcs, and spins, that are synchronized to the rhythm of a musical selection
  - MUSIC students compose the digital score
  - IST students implement motions in Java
  - Together students test and debug to ensure synchronization and timing of movements (between animation and music) which was critical to the quality of the dance

https://www.avid.com/sibelius
http://lejos.sourceforge.net
http://mindstorms.lego.com
Interdisciplinary Project Teams

- **Team Composition**
  - IST Majors (8 students)
    - Distributed Computing (juniors)
    - 1 student per team
  - General Education (19 students)
    - Music Theory Course
    - Diverse backgrounds
    - 2-3 students per team

- **Team Selection Criteria**
  - Course performance
  - Complexity of assigned song
  - Perceived student expectations based on individual work ethics in the classroom
Team and Project Preparation

- Experts in each field
  - Music students vs. IST (the “smart”) students
  - IST students realized they needed to rely on music students to learn more about song for which they were writing code for choreography
  - Level playing field for all students
  - Needed to work together as a team for success of project

- Project Structure
  - Classes offered during same weekday time slot
  - Both courses offered in computer labs
  - Team project days listed in syllabi for each course
  - Faculty members present during all project sessions with additional lab hours scheduled to complete project tasks outside of class

- On-line Course Repository
  - Team space for sharing and storing Sibelius files, WAV files, choreography design, and the Java source code files
  - Active-Learning exercises in individual courses to prepare students for project
Collaborative Learning

- Perceived collaborative learning between interdisciplinary members
  - Students started using a common language to describe the dance steps, assigning tasks, setting deadlines, planning for future changes, and working together as a cohesive team
  - Teams were very excited about the outcome of the robot dance project and would often stay after class to work on their projects so that their dance would be better than other teams

- Joint appreciation
  - The IST student appreciated the time and effort that the Music student had put into the digital musical score and the choreography
  - Music student appreciated the attention to detail and knowledge that was shown by the IST student for the implementation of the robot dance

- Team performance among average participants
  - Worked better as a whole
  - Were more creative
  - Seemed to have more fun with the project
Feedback and Ranking

Student project feedback

- 92.59% - this project was a creative learning experience
- 88.89% - enjoyed working with students in other disciplines
- 96.30% - felt that both Music and IST students worked together as a team to create a successful and complete project
- 88.89% - recommend offering this project again to Music/IST students in the future

Ranking among team competencies with regard to the successful completion of a project

<table>
<thead>
<tr>
<th>Team Competency</th>
<th>Description</th>
<th># Students</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Students effectively used written or verbal communications to interact, ask questions, and convey information with faculty and students during all phases of the project.</td>
<td>27</td>
<td>100.00%</td>
</tr>
<tr>
<td>Commitment</td>
<td>Students were dedicated to completing the project and showed a strong work ethic via active participation during course and team meetings.</td>
<td>24</td>
<td>88.89%</td>
</tr>
<tr>
<td>Cooperation</td>
<td>Students worked together as a team to solve problems and implement solutions.</td>
<td>19</td>
<td>70.37%</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Students shared and demonstrated their knowledge and understanding of related subject material and concepts.</td>
<td>18</td>
<td>66.67%</td>
</tr>
<tr>
<td>Contract</td>
<td>Students were prepared for team meetings, completed assigned tasks by specified deadlines, earned trust of team members, held accountable for actions, and performed in a professional manner.</td>
<td>16</td>
<td>59.26%</td>
</tr>
<tr>
<td>Command</td>
<td>Students demonstrated leadership qualities by keeping team members motivated and focused by creating a positive team environment while moving the project forward.</td>
<td>15</td>
<td>55.56%</td>
</tr>
<tr>
<td>Creativity</td>
<td>Students shared original and innovative ideas, various perspectives and possibilities, and solutions that were a result of “thinking outside of the box”.</td>
<td>14</td>
<td>51.85%</td>
</tr>
</tbody>
</table>
Session Evaluations & Drawing

• Download and open OLC Conferences mobile app
• Navigate to specific session to evaluate
• Select “Evaluate Session” on session details screen (located under session type and track)
• Complete session evaluation*

*Each session evaluation completed (limited to one per session) = one contest entry

Five (5) $25 gift cards will be awarded to five (5) individuals
Must submit evals using the OLC Conferences mobile app or website