Including Peer and Self-Assessment in a Continuous Assessment Scheme in Electrical and Electronics Engineering Courses

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• **Benefits of self-assessment (SA) and peer assessment (PA):**
  – Improvement of critical thinking skills and motivation
  – Greater sense of responsibility
  – Quick feedback
  – Observe and learn how peers address the same problem
  – Help the instructors to monitor the students progress
  – Reduce the teachers’ workload
  – Reliable and valid

• **Objectives:**
  – Comparison of different assessed activities
  – It is possible to substitute the instructor grading by the SA and PA?
  – Perceived usefulness of SA and PA
**Research context**

- Signals and Systems for E&EE
- Continuous evaluation scheme
- Voluntary SA and PA
- **Cumulative data from 6 semesters (>275)**

**Research design**

- PA of homework exercises
- SA of classroom exercises
- Survey about the evaluation scheme and benefits of SA and PA

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### TABLE I

<table>
<thead>
<tr>
<th>Activity</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework exercises (HW)</td>
<td>14 %</td>
</tr>
<tr>
<td>Classroom written exercises (CE)</td>
<td>20 %</td>
</tr>
<tr>
<td>Online tests (OT)</td>
<td>16 %</td>
</tr>
<tr>
<td>Laboratory practices (LP)</td>
<td>10%</td>
</tr>
<tr>
<td>Final exam (FE)</td>
<td>40%</td>
</tr>
</tbody>
</table>

- Correlation coefficients between assessed activities
- Agreement or disagreement with survey items
1. Students give their homework to the instructor
2. Instructor arbitrarily gives a homework to a peer
3. Instructor gives a solution model for the homework
4. **Peers assess and grade** the homework: **PA**
5. Instructor collects all the assessed exercises
6. Instructor... copys the grades
7. gives back the assessed exercise to students
8. acts as a moderator in case of disagreement with the assessment
1. Students solve the proposed exercise

2. Instructor photocopies the exercises and gives back the original to students

3. Instructor gives a solution model for the exercise

4. Students **assess their own exercises**: SA

5. Instructor collects all the assessed exercises, checks that students corrected and graded their solution without taking into account new comments, copies the grades and gives back the exercises
Correlation coefficients:

- Relatively high correlation coefficients between CE (SA) and the rest of assessed activities (except OT)
- Relatively high correlation coefficients between HW (PA) and CE, CA, and LP
- Low correlation coefficients between OT and the rest of activities
RESULTS AND DISCUSSION II

Classroom exercises marks (SA) vs final exam marks (IA)

- Relatively high correlation coefficient (0.50)
- Some outliers
RESULTS AND DISCUSSION III

Homework marks (PA) vs final exam marks (IA)

![Scatter plot showing the correlation between homework marks and final exam marks.](image)
RESULTS AND DISCUSSION

Online tests marks (AA) vs final exam marks (IA)

Low correlation coefficient (0.25)
### Survey items

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.1</td>
<td>It is feasible to understand and assimilate all the contents of the course</td>
</tr>
<tr>
<td>I.2</td>
<td>The weight of the homework in the final mark (14%) is adequate</td>
</tr>
<tr>
<td>I.3</td>
<td>The weight of the Moodle tests in the final mark (16%) is adequate</td>
</tr>
<tr>
<td>I.4</td>
<td>The weight of the classroom exercises in the final mark (20%) is adequate</td>
</tr>
<tr>
<td>I.5</td>
<td>The weight of the laboratory practices in the final mark (10%) is adequate</td>
</tr>
<tr>
<td>I.6</td>
<td>The weight of the final exam in the final mark (40%) is adequate</td>
</tr>
<tr>
<td>I.7</td>
<td>Conducting PA of my peers exercises helps me to understand and assimilate the course contents</td>
</tr>
<tr>
<td>I.8</td>
<td>PA from my peers helps me to understand and assimilate the course contents</td>
</tr>
<tr>
<td>I.9</td>
<td>Conducting SA helps me to understand and assimilate the course contents</td>
</tr>
<tr>
<td>I.10</td>
<td>Conducting PA of my peers exercises is more helpful than SA of my own exercises</td>
</tr>
<tr>
<td>I.11</td>
<td>IA received is more helpful than PA from my peers</td>
</tr>
<tr>
<td>I.12</td>
<td>IA received is more helpful than my own SA</td>
</tr>
<tr>
<td>I.13</td>
<td>I always read the feedback received from my peers (not only the grade)</td>
</tr>
<tr>
<td>I.14</td>
<td>I always read the feedback received from the instructor (not only the grade)</td>
</tr>
</tbody>
</table>
Course objectives are achievable (I1)
General agreement with evaluation scheme (I2-I6)
Online test (I.3), final exam (I.6)?

Survey answers

- Totally agree
- Agree
- Neutral
- Disagree
- Totally disagree
• Conducting PA helps to 65% of students (I.7)
• PA from their peers is useful for only 30% (I.8)
• SA helps to 45% (I.9)
• PA is not better than SA (I.10)
• IA helps more than PA (I.11)
• IA is worse than SA (I.12)
• PA and IA feedback are useful (I.13-I.14)
CONCLUSIONS

- High correlation between the SA and PA assessment marks with final exam marks. Therefore, peer and self-assessed exercises marks could be used to substitute the final exam marks.
- Students had a positive opinion about the weights assigned to homework, classroom exercises, and laboratory practices.
- Students express a positive opinion about the usefulness of conducting peer assessment but they mistrust of being peer assessed and preferred to be instructor assessed to PA.
- Less than half of student considered that SA helps them to assimilate the course contents but most of them preferred SA to instructor assessment.
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Thanks for your attention

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RESULTS AND DISCUSSION

Continuous assessment marks vs final exam marks (IA)

- Relatively high correlation coefficient (0.50)
RESULTS AND DISCUSSION

Final marks vs final exam marks (IA)