Evaluating the Impact of Project-Based Learning (PjBL) on Polytechnic and GCE A-level Students in Singapore

Introduction

• PjBL is a learner-centred approach adopted in an interprofessional module on Health Systems in year-one among five Singapore Institute of Technology health sciences programmes.
• The students have either a background of polytechnic diplomas with practical-oriented curricula to be industry-ready, or the Singapore-Cambridge General Certificate of Education Advanced Level (GCE A-level) with an emphasis on critical thinking in preparation for university education.

Study Objective

• To determine if there is a difference in (1) cognitive learning, (2) motivation to learn, (3) self-directed learning and (4) class engagement and participation between these two groups of students after the implementation of PjBL.

Study Method

• A self-report baseline survey was administered to the same students on 22 Sept 2016 at the beginning of the academic year and on 26 Nov 2016 after completion of the module.

Outcome Measurement

• Outcomes were assessed using the following validated instruments:
  1. Revised Learning Indicators Scale (RLIS): cognitive learning
     • A 7-item questionnaire rated on a 5-point Likert scale from 0=‘never’ to 4=‘very often’. RLIS correlates with learner empowerment, affective learning and motivation. Cronbach’s alpha was 0.84 (Rubin, Rubin, Graham, Perse & Seibold, 2010).
  2. Motivated Strategies for Learning Questionnaire (MSLQ): motivation to learn
     • A 31-item instrument measured on a 7-point Likert scale from 1 = ‘not at all true of me’ to 7 = ‘very true of me’. MSLQ comprises 3 general motivational constructs of value components (intrinsic goal orientation, extrinsic goal orientation and task value), expectancy components (control of learning beliefs and self-efficacy for learning and performance) and an affective component (test anxiety). Cronbach’s alphas were robust, ranging from 0.52 to 0.93 (Pintrich, 1991).
  3. Self-Directed Learning Readiness Scale for Nursing Education (SDLRS-NE): self-directed learning
     • A 40-item questionnaire rated on a 5-point Likert scale from 1=‘strongly disagree’ to 5=‘strongly agree’. It has 3 subscales: self-management, desire for learning and self-control. Cronbach’s alpha was 0.87 (Fisher & King, 2010).
  4. Classroom Interaction Survey: class engagement and participation
     • A 6-item questionnaire which included one free text response to find out the frequency of the student responding to questions and comments in class. The other five questions assessed the frequency of students contributing to class and volunteers in class on a 5-point Likert scale from 1=‘strongly disagree’ to 5=‘strongly agree’. Cronbach’s alpha was 0.87 (Fassinger, 1995).

Baseline Data

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>GCE A-level students (n=50)</th>
<th>Polytechnic students (n=48)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years – mean(SD)</td>
<td>19.8 (1.6)*</td>
<td>22.6 (3.4)*</td>
</tr>
<tr>
<td>Male – n(%)</td>
<td>11(22%)</td>
<td>12(25%)</td>
</tr>
<tr>
<td>Ethnicity – n(%)</td>
<td>45(90%)</td>
<td>38(79%)</td>
</tr>
<tr>
<td>Chinese</td>
<td>Malay</td>
<td>Indian</td>
</tr>
<tr>
<td>48(%)</td>
<td>4(%)</td>
<td>1(2%)</td>
</tr>
<tr>
<td>4(%)</td>
<td>4(%)</td>
<td>6(13%)</td>
</tr>
<tr>
<td>29(58%)</td>
<td>21(44%)</td>
<td></td>
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</tbody>
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*Age was significantly different between the two groups (p< 0.05).

Statistical Analysis

• Analysis of covariance (ANCOVA) was used to compare group means for outcome measures after PjBL adjusted for baseline values. All assumptions were checked.

Findings and Conclusion

• The lack of significant differences between the two groups (as seen in table below) suggests that PjBL can be adopted by health sciences undergraduate students regardless of their previous educational background.

References