Equality in higher education

A mixed method study on relations between self-efficacy, students’ background and students’ success for Nursing and Computer Science students.

Part of the UCN research programme:

”Inequality and disadvantaged people”
Presentation

• Project participants:
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  – Finn E. Nordbjerg (Computer Science)
  – Rikke C. B. Rasmussen (Nursing)

• Acknowledgements
  – Tanja Miller (Research and Development)
  – Mette Braad (Nursing)
Background

• In the autumn 2013 we carried out a preliminary study:
  – As student advisors we have observed that some students are encountering study-related problems for no obvious reasons.
  – We interviewed students who had experienced problems (two nursing students and two computer science students), and
  – We made a comprehensive desk research

• This made us focus on the concept of self-efficacy.
  (Bandura A. Self-efficacy: The exercise of control. New York: Freeman; 1997).

• Perceived Self-efficacy (SE) is one’s believe in one’s ability to perform a given task or behaviour with success
  – If one believes that one can, then one’s chances for success is greater than, if one doubts one’s capabilities – also if the other qualifications with regards to the task at hand are the same.
Self-efficacy

• International research shows relations between self-efficacy and academic success.
• On the other hand, we didn’t find much research about how to improve self-efficacy in a study context.

• Self-efficacy is not the same as self-esteem:
  – SE is context dependent
Research questions

1. How is self-efficacy related to students’ sex, age, and socioeconomic background?
2. Is self-efficacy related to successfully completion of the first academic year?
3. Can a specific intervention strengthen the students’ self-efficacy?
Research Design – Mixed method

• Originally designed as a quasi-randomised study:
• Four classes were chosen for the study - two 1. semester computer science classes and two 1. semester nursing classes (one intervention and one reference group pr. programme).
• Background data (sex, age, socioeconomic background (parent educational level)) was collected.
• SE was measured in all classes three times during the first study year (2014/2015).
• Workshops designed to strengthen SE were given in November 2014 for one nursing and one computer science class (intervention groups).
• Unfortunately:
  – Due to practical problems (scheduling etc.) only a small number of students participated in the workshops. Hence, we are unable to evaluate any effect from the workshops based on quantitative data.
  – Instead, the participating students participated in focus group interviews after the workshops.
  – (In order to get quantitative data about the effect of the workshops we tried to repeat the workshops in the autumn of 2015. Only computer science students signed up for the workshops, so in best case we will only have very slender data.)
• At the end of the first study year data about completion was collected.
Measuring self-efficacy

• International, standardised and well-tested questionnaire: NERA 2016 - {fen|rkr}@ucn.dk
Self-efficacy

• According to Bandura SE depends on the following factors:
  1. Mastering
  2. Vicarious Experience
  3. Verbal Persuasion
  4. Physiological and Affective States
Self-efficacy - Mastering

- The experiences of success in relation to a given class of challenges is the strongest factor.
- Success strengthens SE and failure weakens SE.
- Especially is success early in the course of events important.
- If success is achieved too easily, then one’s inclination to quit, when obstacles are encountered, will increase.
- So the experience of ability to overcome obstacles is also important.
Self-efficacy and goals

• The experience of mastering is central in relation to SE
  – The experience of success strengthens SE
  – The experience of success can be achieved through work towards realistic learning outcomes (goals)
  – When a learning outcome is reached, it will strengthen SE
Self-efficacy and goals

Goals are to be in this zone

1: Learner can do
2: Learner can do with help
3: Learner cannot do

• The goals (learning outcomes) are to be in zone 2 ("proximal goals").
Self-efficacy and goals

The achievement of goals will strengthen SE, and hence increase success in relation to study.
The intervention

• Two workshops of two hours duration with a week between:
  • Workshop 1:
    – Introduction to the concept of self-efficacy
    – Focus on formulating proximal goals

"Make stumbling stones to stepping stones"
The intervention

• Workshop 2:
  – Work with formulation of goals with respect to time tables and deadlines.
  – General advices on study practice.

• In both workshops:
  – Small exercises.
  – Lots of peer-feedback.
  – Concrete tools and techniques.
Results – qualitative

• Qualitative results (not finished):
  – Themes identified in the interviews:
    1. **Mastering**: Concrete experience of mastering through working with proximal goals and time planning.
    2. **Vicarious experiences**: Learning from discussions with fellow students.
    3. Better understanding of one’s way of learning and working in a study context
A few sample citations

**Mastering**
Kristoffer: “It was very inspiring and (I) think that others should have the opportunity to get a good tool. Instead of you just trying to learn something and you are getting a little teaching in it, but why is it really that you are to learn this, what is it good for, what is it that you want to achieve with this teaching and stuff like that.”
Interview 2, p 5 l 18

Sandra: “I have been really good at setting may a little unrealistic goals for my self, often. Because I want to do the best of the best. Maybe that about having a little lower demands to one selves. Feel better about achieving that instead of experiencing it as a defeat, when one cannot achieve. In a way.”
Interview 3, p 2 | 30

**Vicarious experiences**
Kate: “(...) supplementing each other and hear how others are doing, maybe having the same goals, but doing it in other ways. So, maybe I could take her in and say: well, that’s (bloody) smart, I’ll try to do that. And see if it works for me........(...). Also because we have to work together in practice in order to reach the goal ands could use each other both before, on the road and after. So this, I think, was very good. It gave a better outcome, I think.
Interview 4, p 4 l 30

**Better understanding of**
Patrick: “But, what I took with me was that it sort of is myself that defines my borders. That’s me that decide what I can achieve. Off course, there some concrete borders. But all borders may be stretched, if I put work and dedication into it. That’s been a good lesson to learn.”
Interview 1, p 6 |13
<table>
<thead>
<tr>
<th></th>
<th>Computer Science</th>
<th>Nursing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex (N, %)</strong></td>
<td>Male: 56 (95 %)</td>
<td>Male: 5 (6 %)</td>
</tr>
<tr>
<td></td>
<td>Female: 3 (5 %)</td>
<td>Female: 82 (94 %)</td>
</tr>
<tr>
<td><strong>Age, mean</strong></td>
<td>22,92 (95% CI: 21,45; 24,39)</td>
<td>20,68 (95% CI: 20,14; 21,23)</td>
</tr>
<tr>
<td><strong>GPS, mean</strong></td>
<td>GPSA (Sept. 2014)</td>
<td>2,96 (95% CI: 2,82; 3,09)</td>
</tr>
<tr>
<td></td>
<td>GPSB (Dec. 2014)</td>
<td>3,08 (95% CI: 2,92; 3,24)</td>
</tr>
<tr>
<td></td>
<td>GPSC (June 2015)</td>
<td>3,03 (95% CI: 2,91; 3,16)</td>
</tr>
<tr>
<td><strong>Admission</strong></td>
<td>Group 10/20:</td>
<td>N = 43 (73 %)</td>
</tr>
<tr>
<td></td>
<td>Grade mean: 5,33</td>
<td>Grade mean: 7,30</td>
</tr>
<tr>
<td></td>
<td>(95% CI: 4,79; 5,88)</td>
<td>(95% CI: 6,90; 7,7)</td>
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<td></td>
<td>Group 30/31: (N, %)</td>
<td>N = 16 (27 %)</td>
</tr>
<tr>
<td></td>
<td>N = 8 (9 %)</td>
<td>N = 86 (1 missing)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>N = 59</td>
<td>N = 86 (1 missing)</td>
</tr>
<tr>
<td><strong>Socio-economic background</strong></td>
<td>Parent educational level:</td>
<td>Parent educational level:</td>
</tr>
<tr>
<td></td>
<td>1: Primary or secondary school</td>
<td>1: Primary or secondary school</td>
</tr>
<tr>
<td></td>
<td>2: Vocational education</td>
<td>2: Vocational education</td>
</tr>
<tr>
<td></td>
<td>3: AP or equivalent (2 – 2½ year)</td>
<td>3: AP or equivalent (2 – 2½ year)</td>
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<tr>
<td></td>
<td>4: Bachelor or higher</td>
<td>4: Bachelor or higher</td>
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<tr>
<td></td>
<td>Missing: 2 (3 %)</td>
<td>Missing: 11 (13 %)</td>
</tr>
<tr>
<td></td>
<td>Mean: 2,61 (95% CI: 2,33; 2,90)</td>
<td>Mean: 3 (95% CI: 2,76; 3,24)</td>
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</tbody>
</table>
One-way ANOVA

<table>
<thead>
<tr>
<th>Self-efficacy</th>
<th>Sig.</th>
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<tbody>
<tr>
<td>GPSA (Sept. 2014)</td>
<td>0.241</td>
</tr>
<tr>
<td>GPSB (Dec. 2014)</td>
<td>0.921</td>
</tr>
<tr>
<td>GPSC (June 2015)</td>
<td>0.143</td>
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</table>
Logistic regression between self-efficacy and success** among nursing students and computer science students
[OR=odds ratio; 95% CI=95% confidence interval.]

<table>
<thead>
<tr>
<th></th>
<th>Students with high self-efficacy (3.1-3.9)</th>
<th>Students with low self-efficacy (2.1-3)</th>
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<tbody>
<tr>
<td></td>
<td>Success**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>OR</td>
</tr>
<tr>
<td>Crude</td>
<td>133</td>
<td>1.0</td>
</tr>
<tr>
<td>Fully adjusted*</td>
<td>132</td>
<td>1.0</td>
</tr>
</tbody>
</table>

• *Adjusted for age, socioeconomic background and grades
• **Success= successfully completion of the first academic year
Logistic regression between socioeconomic background and success among nursing students and computer science students. [OR=odds ratio; 95% CI=95% confidence interval.]

<table>
<thead>
<tr>
<th>Students where parents have a BA or higher</th>
<th>Primary or secondary school</th>
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<tbody>
<tr>
<td></td>
<td>Succes</td>
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<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Crude</td>
<td>132</td>
</tr>
<tr>
<td>Fully adjusted*</td>
<td>132</td>
</tr>
</tbody>
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* Adjusted for age, self-efficacy and grades
Future work

• A follow-up project in 2016 – 2017 is launched
• Preliminary research questions (to be adjusted and focused depending on the findings of this study (qualitative analysis):
  1. Which specific needs do students at higher education programmes with poor socio-economic background have with respect to educational support?
  2. Can a specific educational support be developed aimed at students with poor socio-economic background that aims at strengthen self-efficacy and decrease drop out?