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Student Opinions about the Seven-step Procedure in Problem-based Hospitality Management Education

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ABSTRACT

This study investigates how hospitality management students appreciate the role and application of the seven-step procedure in problem-based learning. A survey was developed containing sections about personal characteristics, recall of the seven steps, overall report marks, and 30 statements about the seven-step procedure. The survey was administered to a sample of 101 first-, second- and third-year hotel school students. Results show a low recall but positive opinion about the seven-step procedure. Particularly step 4 (conceptualizing), step 6 (self-study between tutorials) and step 7 (synthesizing new information) need attention. Some suggestions are put forward for strengthening the process of problem-based hospitality education.

Keywords: seven-step procedure, problem-based learning, hospitality management education

INTRODUCTION

Hospitality management schools design their curricula to meet the changing demands of the hospitality industry (Suh, West and Shin, 2012). Different opinions about the balance between practice and theory in a hospitality management program have been expressed (Alexander, 2007). The value of operational practice in a teaching hotel in which students learn by a hands-on approach has been widely recognized. While practical training suits well with the activist learning style of many hospitality management students serious attention should also be paid to actively engaging students in reflection and theorizing (Lashley & Barron, 2006). Approaches to teaching and learning that focus on self-directed, collaborative and constructive learning in a real-world context are indicated to engage students in integrating theory and practice. Problem-based learning is an educational strategy that aims at optimizing learning by using real-life problems that are discussed in a small group of students. Problem-based learning seems to be particularly well-suited for disciplines with a clear professional focus, where integrating theory and practice is of great importance. Where problem-based learning has found world-wide acceptance and recognition in medical education, relatively

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few hospitality management schools have implemented problem-based learning as an educational strategy (De Boer & Otting, 2011; Kivela & Kivela, 2005; Zwaal & Otting, 2010; 2012). The current study is conducted in a setting that best matches the hybrid model of PBL (Hung, 2011) and intends to contribute to the discussion about problem-based hospitality management education.

Experiences and research on the seven-step procedure in problem-based learning

In this study, we focus on the seven-step procedure that was introduced by Schmidt (1983):

Step 1: Clarifying terms, determining the main points, and summarising the text.
Step 2: Defining the problem.
Step 3: Analysing the problem.
Step 4: Structuring the findings of step 3.
Step 5: Formulating learning objectives for self-directed learning.
Step 6: Searching and studying relevant information.
Step 7: Reporting, synthesising and evaluating new knowledge.

The seven-step procedure was developed at Maastricht University as a scaffolding tool to structure the learning processes in problem-based learning (Barrett, 2005; De Graaff & Kolmos, 2003; Schmidt, Rotgans, & Yew, 2011; Segers, Van den Bossche, & Teunisse, 2003). Scaffolding supports the development of students' meta-cognition and reflection in PBL-tutorials (Hmelo-Silver, 2004; Hmelo-Silver, Duncan, & Chin, 2007). New learning builds on prior knowledge and working with the seven-step procedure illustrates the sequential and cumulative nature of the problem-based learning process (Schmidt, Rotgans, & Yew, 2011; Yew, Chng, & Schmidt, 2011). The seven steps closely match the different stages in the empirical cycle of research and scientific inquiry: from formulating a problem statement and generating hypotheses to collecting data and reporting and discussing the findings. Although the seven-step procedure is used in different programs, it is not a defining characteristic of problem-based learning.

One cannot assume that beginning students already possess sufficient skills for self-directed learning (Miflin, 2004a). Working in small groups, collaborating with one another, and being self-responsible for learning are new experiences for many students (Miflin, 2004b). Therefore, attention has to be paid to explaining and training the seven-step procedure in problem-based learning to all beginning students. The application of the seven-step procedure in PBL-tutorials enables the students to cope with the new learning environment and after several weeks of working with problem-based learning students clearly showed improved adaptation and a growing awareness of the seven-step procedure as a helpful and useful tool (De Boer & Otting, 2011). Nevertheless, several beginning students experience problem-based learning as confusing, frustrating, and stressful when confronted with unstructured and complex tasks. Lack of experience in self-directed learning and a low level of problem solving skills may impede the seven-step procedure in problem-based learning (De Boer &

Otting, 2011). A potential downside of using a tool like the seven-step procedure is that it becomes a routine or even a ritual. Senior students often experience the seven-step procedure as too structured, restrictive, and controlling. A rigid application of the seven-step procedure may lead to ritual behavior, lack of motivation, boredom, and insufficient depth and width of information processing (Dolmans, Wolfhagen, Van der Vleuten, & Wijnen, 2001; Wijnia, Loyens, & Derous, 2011). In the course of time adjustments and modifications have been made to the seven-step procedure. Suggestions for improving the PBL-process are for instance giving assigned roles to the students, frequent testing, presentations, self-assessment exercises or the provision of worksheets as scaffolding tools (Cardozo, Raymond, & White, 2012; Choo, Rotgans, Yew, & Schmidt, 2011). Other adjustments to the seven-step procedure were writing assignments, case reports, or essays to get a better idea of what the students have been learning and to monitor how students apply knowledge to the present problem and other problems (Nuutila, Törmä, & Malmi, 2005; Schultz & Christensen, 2004).

At Maastricht University concerns were expressed about how students study in a PBL-curriculum and apply the seven-step procedure (Dolmans et al, 2001; Moust et al, 2005). Several options for improving problem-based learning were studied. Introduction of the Optima Card with explanations of the expected learning activities in the seven-step procedure did not lead to conclusive results (Segers, Van den Bossche, & Teunissen, 2003). However, replacement of the seven-step procedure by a four phase Active Self-directed Learning Model showed satisfactory improvements (Czabanowska, Moust, Meijer, Bäck, & Roebertsen, 2012).

At the hospitality management school in which this study is situated a Blue Card with explanations of the seven-step procedure has been developed and applied (De Boer & Den Dulk, 2009). However, until now no study has been done on how students work with the seven-step procedure and the Blue Card. Did students internalize the seven-step procedure and are they able to recall all the steps of the seven-step procedure without help? How do students value the application of the seven-step procedure in general and more specifically the different steps of the seven-step procedure? How much time do they spend on the different steps of the seven-step procedure? Do students perceive the seven-step procedure as an important tool? Reflecting on many years of experiences with problem-based learning at Maastricht University, Moust, Van Berkel, and Schmidt (2005) argued that the seven-step procedure in practice showed several signs of erosion like skipping the brainstorming and elaboration phases, and reducing the synthesis and elaboration phase to reporting. Research of learning processes gave some insight in what actually happens in PBL-sessions (Barrett, 2013). However, more research is needed on what students learn in PBL and how they experience and value problem-based learning. More specifically, it would be interesting to learn more about students' opinions about the seven-step procedure in PBL-tutorials. Moreover, little is known about other possible shortcomings in the execution of the seven-step procedure.

The seven-step procedure is a flexible way to structure the collaborative learning process. The sequencing of the steps is recursive instead of serial and the time spent on each one of the steps is flexible. Focus group interviews about motivating and non-motivating aspects of problem-based learning showed that students perceived the seven-step procedure as useful for first-year students whereas second-year students experience the seven-step procedure as too rigid and prefer less direction and more flexible scaffolding (Wijnia, Loyens, & Derous, 2011). How much scaffolding and structure do students need in PBL-tutorials? Do 1st year students experience the seven-step procedure as more important than students in the 2nd and 3rd year?

Problem statement and research questions

The main goal of the study is to generate an overview of student opinions about the seven-step procedure in problem-based learning and to investigate the relationship between knowledge and appreciation of the seven-step procedure.

Problem statement:
How do hospitality management students appreciate the seven-step procedure in problem-based learning?

Research questions:
1. How well do students know the seven-step procedure?
2. What opinions do students hold about the seven- step procedure?

METHOD

Sampling

A mail was send to all SHMS tutors with a request for permission to administer the seven step survey in their PBL-sessions. This resulted in a positive response by five different tutors allowing us to administer the survey to six first-year tutorial groups, three second-year workshops, and three third-year tutorials. A breakdown of the sample with respect to study year, module, gender and credits gained is included in table 1.

Table 1: Sample characteristics.

	n	Male	Female	Credits (M, SD)
Year 1: • Guest Experience • Hospitality Operations	47	 7 6	 31 3	12.02 (12)
Year 2: • Operations Design	35	 10	 25	74.57 (13)
Year 3: • HOM • SHM	19	 2 4	 6 7	125 (13)
	101	29 (28.7%)	72 (71.3%)	

The age of the respondents ranges from 17 to 29 with a mean of 20.31 (SD = 2.13). The majority of the students are Dutch (79.2%), German (8.9%) or Chinese (5.9%). The other 6% have the Bulgarian (4%), Ukrainian (1%) or Thai (1%) nationality.

Instrumentation

Based on the literature studied a survey was developed consisting of several sections. The first section of the survey contained personal characteristics like age, gender, nationality and study year. The second section included an unaided recall question to list the seven steps. Answers were coded as correct or incorrect using a set of keywords representing each of the seven steps. The third section consisted of a set of 30 statements about the seven-step procedure. In a fourth section, subjects were asked to provide an overall report mark for each of the following topics: problem-based learning, the seven-step procedure, and the Blue Card.

Data collection

Data collection was scheduled in week 8 of module period 2. The survey was administered at the beginning of PBL-sessions and workshops. Filling out the questions took between 10 - 20 minutes with an average of 15 minutes. Participation was voluntarily and no incentives were provided.

RESULTS

Reproduction of the seven-step procedure

The hospitality management students were unable to reproduce all seven steps correctly (table 2). Almost half of the students (46.5%) could reproduce two or less of the seven steps. There is no significant difference in recall rate between first, second and third year students ($F_{2, 98} = 1.246$; $p = .292$) or between male and female students ($t = -1.564$; $df = 99$; $p = .121$).

Table 2: The number of steps correctly listed

	Year 1	Year 2	Year 3	Total	Percent	Cumulative %
0	9	6	4	19	18.8	18.8
1	4	3	1	8	7.9	26.7
2	13	4	3	20	19.8	46.5
3	7	6	3	16	15.8	62.3
4	11	9	3	23	22.8	85.1
5	3	5	4	12	11.9	97
6	0	2	1	3	30	100
7	0	0	0	0	0	
Total	47	35	19	101	100	
Mean	2.34	2.91	2.84	2.63		

Steps 1, 2 and 5 are most frequently listed correctly (table 3). Step 5 is about formulating learning goals, step 1 is about reading and understanding the task, and in step 2 the problem is defined. The step which was hardly ever mentioned by the students is step 4 (creating a concept map), while step 3 (analyzing the problem) and step 6 (self-study outside the group) are also not frequently recalled.

Table 3: Unaided recall of the seven steps.

	Frequency	Percent
Step 1	62	61.4
Step 2	61	60.4
Step 3	19	18.8
Step 4	2	2.0
Step 5	63	62.4
Step 6	26	25.7
Step 7	33	32.7

As shown in table 4, the number of steps correctly listed is not significantly correlated with number of credits gained, nor with the overall rating for problem-based learning, the seven-step procedure or the Blue Card.

Table 4: Correlation between number of correctly listed steps, credits gained, and rating of problem-based learning (PBL), seven-step procedure (SSP) and Blue Card.

	Credits	PBL	SSP	Blue Card
Correct steps	.128	.054	-.085	-.083

Opinions about the seven-step procedure

In the next section of the survey, students were asked to rate 30 statements about the seven-step procedure, using a 5-point Likert scale (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree). As shown in table 5, students agree with 16 of the statements. The highest mean score is for the statements ‘the seven-step procedure provides clear guidelines for PBL’ and ‘the seven-step procedure structures the learning

processes. Some points of concern are that it is not 'always clear which step we are doing' and that students disagree that 'without the seven-step procedure we would learn less', which suggest they think they could do equally well without it.

Table 5: Opinions about the seven-step procedure (n = 101).

	Mean	SD
The seven-step procedure provides clear guidelines for PBL	3.92	.64
The seven-step procedure structures the learning process	3.88	.57
The seven-step procedure is a useful tool for PBL	3.86	.72
The seven step procedure is an efficient tool for PBL	3.75	.61
We use the blue card to check the seven steps	3.65	1.14
The seven-step procedure is a widely applicable tool	3.57	.77
The tutor helps us to stick to the seven-step procedure	3.54	.76
We sometimes return to earlier steps	3.39	.84
I like the seven-step procedure	3.32	.78
The seven-step procedure helps us to manage group dynamics	3.28	.85
The seven-step procedure is a rigid procedure	3.25	.82
The seven-step procedure limits flexibility in problem solving	3.21	.93
Applying the seven-step procedure is mandatory	3.19	.77
Using the seven-step procedure is at the discretion of the group	3.15	.61
More training should be given to use the seven-step procedure	3.08	.95
The seven-step procedure matches the way professionals deal with real world issues	3.01	.83
Start and finish of every step are clearly communicated	3.00	1.01
The agenda for the PBL session is dictated by the seven steps	3.00	1.00
The seven-step procedure is more aimed at solving problems than learning from problems	2.99	.95
The seven-step procedure can be used for every task	2.97	.97
Without the seven-step procedure we would learn less	2.90	.89
All seven steps are equally important	2.86	.96
It is always clear which step we're doing	2.75	1.03
The seven-step procedure hinders group functioning	2.70	.85
Some of the seven steps are unclear	2.63	.87
The seven-step procedure is too detailed	2.57	.82
The seven-step procedure is only useful in first year	2.52	.93
Some steps are missing in the seven-step procedure	2.38	.62
We spend an equal amount of time to every step	2.17	.87
The seven steps are **not** in a logical order	2.03	.71

A stepwise regression analysis of the 30 statements to predict the overall mark for the seven-step procedure resulted in a set of four statements explaining 57% of the variance. These four statements are:

- I like the seven-step procedure ($\beta = .372$);
- The seven-step procedure matches the way professionals deal with real world issues ($\beta = .315$);
- The seven-step procedure hinders group functioning ($\beta = -.230$);
- Without the seven step procedure we would learn less ($\beta = .206$).

No significant differences were detected between male and female respondents except for the statement 'We spend an equal amount of time to every step' on which male students scored significantly lower (M = 1.90) than the females (M = 2.28).

DISCUSSION

The main goal of the study was to investigate how students appreciate the seven-step procedure in a problem-based hospitality management program. The two research questions are used to reflect on the findings and to formulate recommendations for the practice and study of problem-based learning.

How well do students know the seven-step procedure?

Results on the reproduction of the seven-step procedure showed that students found it difficult to recall the seven steps of the seven-step procedure. A likely explanation for the low rate of recall is that students have not sufficiently internalized the seven-step procedure. The reason why the internalization did not occur might be a lack of training and instruction in applying the procedure or that seven steps is simply too much to remember so students only remember the first 2-3 steps. Another reason could be that since they are expected to always bring the Blue Card with them to the PBL-tutorial they don't find it necessary to memorize the seven steps. A third possible reason that would only apply to the first year students is that they have limited experience with the seven-step procedure, since they were surveyed in their second module. A fourth option would be that tutors allow students to deviate from the procedure. The way tutors engage with the seven step procedure and lead students through it might have a substantial influence on how well students know it and how well they apply it. Since students indicate (in another section of the survey) that tutors help them to stick to the seven-step procedure, we do not consider this explanation very plausible. A last, but less likely, option would be that because students have internalized the procedure it has become very difficult to reproduce every separate step. Further research is indicated to determine which of the suggested explanations is correct and what could be done to improve the retention rate.

The steps that were more frequently listed are step 1 (61%), step 2 (60%) and step 5 (62%). If that reflects what students consider to be the key points in the PBL-tutorial, the process seems to be mentally summarized in three steps: (1) Read the case, (2) Define the problem, and (3) Formulate learning issues. Particularly the low recall of steps 3 and 4 – although in line with the signs of erosion as reported in earlier studies – is worrying because these steps are aimed at analytical and conceptual thinking, being critically important but apparently equally challenging steps in the process of problem-based learning.

What opinions do students hold about the seven-step procedure?

The results on the 30 statements show that the hospitality management students in this sample tend to be quite positive about the seven-step procedure. The students agree with the majority

of the statements, indicating that the seven-step procedure provides clear guidelines for problem-based learning, structures the learning processes and is useful and efficient for problem-based learning.

The overall report mark for the seven-step procedure is positive: 6.71. Only third-year students tend to be less positive (5.58), and score significantly lower than first (6.98) and second-year (6.97) students. A similar pattern is noticeable regarding the opinion about the Blue Card. The lower appreciation of the seven-step procedure by the third-year students is in line with other research (Wijnia, Loyens, & Derous, 2011) that showed that senior students prefer more freedom in selecting strategies to deal with the presented problems, while first and second-year students, and particularly those with a vocational background, prefer the structure and guidelines of the seven steps and the Blue Card.

In order to enhance the internalization of all steps but especially those involving higher analytical skills we recommend interventions like (1) documenting the output of every step in the minutes of the meeting, (2) generate criteria and standards for every step of the procedure, (3) experimenting with alternative formats and different numbers of steps, (4) explicitly discuss the roots and rationale of each of the individual steps. Comparative research testing different versions of the seven-step procedure in different PBL-groups is indicated to further investigate the optimal format and function of the seven-step procedure in problem-based hospitality management education.

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