Exploring students’ differences of motivation, interest and self-efficacy in a cross-continent simulation context.

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Introduction

It is a long time since teachers of political science have been using simulations as a teaching method. Literature about the use of simulations in local political issues and international relations goes back to the seventies and eighties when case-studies (Davison, 1975; Mandel, 1987) and teacher guides (Karns, 1980; Khanlian & Wallin, 1975) were written to exchange experiences and expertise. However, the use of simulations in teaching European politics is relatively new (Brunazzo & Settembri, 2014; Zeff, 2003). In this case, simulations offer a chance trying to grasp the complexity of the European Union institutions and different actors at different levels (Guasti, Muno, & Niemann, 2015; Jones & Bursens, 2014). Overall, simulations are very much appreciated by teachers and students because of their degree of ‘real world’-experience (Asal & Kratoville, 2013; Smith & Boyer, 1996; Van Dyke, DeClair, & Loedel, 2000).

Consequently, research that tries to prove the effect of the use of simulations within teaching political science is expanding. However, literature that empirically tests the impact of simulations is still scant, rather anecdotal and methodologically poor, sometimes even contradictory (Asal & Kratoville, 2013; Baranowski & Weir, 2010; Chin, Dukes, & Gamson, 2009; Gosen & Washbush, 2004; Hofstede, de Caluwe, & Peters, 2010; Shellman & Turan, 2006). Overall, each research also uses different concepts with different measurements, which makes comparisons between different studies rather difficult. Therefore, the general aim of this study is to facilitate better comparable research about the effectiveness of simulations. Hence, we believe that the discipline of educational sciences can add value to the existing research by introducing some educational concepts and accompanied measurements. More specifically, some
previously validated scales are tested in a simulations-context. Next, using these scales, we explore students’ differences with respect to a selection of important predictors of academic achievement.

Before effectiveness of simulations can be measured, their possible learning outcomes need to be defined. Three general different learning activities and their resulting learning outcomes on a cognitive, affective, or regulative domain can be distinguished (Pintrich, 1994; Vermunt, 1996). These outcomes have been implicitly acknowledged in different studies that generally focus on teaching and learning political science, including simulations. Cognitive learning outcomes are results of those thinking activities that directly lead to learning in terms of knowledge, understanding, skills and so on (Vermunt, 1996). Within the research field of teaching and learning political sciences such learning outcomes are mostly specified as understanding better theoretical concepts and/or theories (e.g. Andonova & Mendoza-Castro, 2008; Asal, Sin, Fahrenkopf, & She, 2014; Bridge & Radford, 2014; Elias, 2014; Enterline & Jepsen, 2009; Galatas, 2006; Sands & Shelton, 2010), increased knowledge (e.g. Obendorf & Randerson, 2013; Zaino & Mulligan, 2009) and developed skills such as communication skills (e.g. Crossley - Frolick, 2010; DiCicco, 2014; Elias, 2014; Kaarbo & Lantis, 1997). These learning outcomes thus include substantive knowledge and skills development, both defined by Usherwood (2013) as possible learning outcomes of simulations.

Further, affective learning outcomes are the results of feelings that arise during learning and that create an emotional state that may positively, neutrally or negatively affect the learning process (Vermunt, 1996). Research about the use of active learning within political sciences mostly defines these outcomes as interest (e.g. Arnold, 2014; Bridge & Radford, 2014; Roper, 2004; Zaino & Mulligan, 2009) or motivation (e.g. DiCicco, 2014; Jones & Bursens, 2015).

These cognitive and affective activities are directed by regulating activities that indirectly lead to learning results, such as the ability to monitor and, when needed, to adjust the learning process (Vermunt, 1996). This process of learning has thus far not directly been studied in the field of teaching and learning in political science. However, simulation studies often report about the importance of reflective assignments, and debriefing sessions (e.g. Butcher, 2012; Crossley - Frolick, 2010; Elias, 2014; Jozwiak, 2012; Raymond & Usherwood, 2013; Sands & Shelton, 2010; Usherwood, 2013), which are activities that stimulate students to use their reflective skills and therefore foster
Regulative learning outcomes (Vermunt, 1996). An example of a regulative learning outcome is when students realize after the debriefing session that they should be more diplomatic in their negotiating skills. Therefore, they might decide to attend more simulations, also outside of school, and to watch more live negotiations on television or the Internet. Inherently, they thus start regulating their own learning process by adjusting their learning activities to achieve their predetermined goal.

Within teaching political science literature, Usherwood (2013) suggests a third learning outcome of simulations which he defines as group socialization, next to substantive knowledge and skills; which are aspects of the previously described cognitive learning outcomes. Group socialization refers to the opportunities simulations provide which allow for the development of a group identity and for introductions to problem-solving techniques. This phenomenon doesn't fit into the previously defined cognitive, affective and regulative learning outcomes. However, as peer influence can directly or indirectly affect learning (Wentzel & Ramani, 2016), it may be an important characteristic of the simulation-environment that facilitates different learning outcomes. However, this relationship needs further exploring and is not the focus of this study.

Overall, research that focuses on the effectiveness of simulations could aim to elucidate cognitive, affective and/or regulative learning outcomes. The first outcome depends strongly on the set learning goals and the course subject. Therefore, effect measurements need to be very course specific and are often part of the course assessment. Further, the regulative learning outcomes are more process-related, focusing on student learning approaches and more of an indirect objective. Next, affective learning outcomes are important because they have proven to promote cognitive learning outcomes, often in the form of academic achievement (Bandura, 1997; Coutinho & Neuman, 2008; Kusurkar, Ten Cate, Vos, Westers, & Croiset, 2013; Richardson, Abraham, & Bond, 2012; Rotgans & Schmidt, 2011b; Schiefele, Krapp, & Winteler, 1992; Schiefele, Wild, & Krapp, 1995; Vansteenkiste, Zhou, Lens, & Soenens, 2005), and regulative learning outcomes (Donche, De Maeyer, Coertjens, Van Daal, & Van Petegem, 2013; Kusurkar et al., 2013; Rotgans & Schmidt, 2011b; Schiefele et al., 1995; van Dinther, Dochy, & Segers, 2011; Vansteenkiste et al., 2005). Therefore, this study focuses on affective learning outcomes and the following clarifies why accurately measuring motivation, interest, and self-efficacy in particular might be valuable when studying the effects of simulations.
Motivation

Overall, in an educational context, motivation refers to what drives students for learning. Studies about motivation in teaching and learning political sciences usually approach motivation as a one-dimensional construct, in terms of how much motivation students have. When studying effects of simulations, students often are asked how their motivation developed, using either quantitative or qualitative measures (e.g. DiCicco, 2014; Jones & Bursens, 2015). However, one of the leading theories about motivation in education is the self-determination theory (SDT), developed by Deci and Ryan (2000). SDT considers motivation to be multidimensional instead of one-dimensional. Hence, it distinguishes the quantity or amount of motivation from the quality or type of motivation (Vansteenkiste, Sierens, Soenens, Luyckx, & Lens, 2009). Applied to the effectiveness of simulations this implies that not how much motivation students experience would matter, but more so, what kind of motivation they have developed. This multidimensional approach results in a distinction between autonomous motivation, controlled motivation, and amotivation (Deci & Ryan, 2000).

*Autonomous motivation* is characterized by a sense of choice and psychological freedom (Deci & Ryan, 2000). Then, students themselves freely direct their learning process and learning behaviour. For example, it could be that the simulation itself is inherently satisfying e.g. ‘I like attending simulations, I enjoy them’ or that students realize the importance of the simulation for their professional development e.g. ‘It is very important for me to actively participate in the simulation if I want to become good at negotiating’. *Controlled motivation* refers to students experiencing being pressured or coerced (Vansteenkiste, Lens, & Deci, 2006). For example, students could feel pressured by themselves e.g. ‘I force myself to attend as much simulations as possible because it will look good on my future CV’ or by their environment e.g. ‘I attend this simulation because it is part of the mandatory curriculum’. Finally, students could also be *amotivated* when they lack any intention to learn (Ryan & Deci, 2000), e.g. ‘Although it’s a mandatory course, I will not attend the in-class simulation because I don’t feel like it’.

Of all three types of motivation, autonomous motivation is the most valuable one because it is an important predictor for academic achievement and has a strong relationship with the development of adequate regulative learning outcomes (e.g. Donche et al., 2013; Kusurkar et al., 2013; Vansteenkiste et al., 2005). Hence, research has focused on student characteristics and their relationship with autonomous
motivation. Previous studies reveal that female students report higher levels of autonomous motivation than male students (Vallerand, Fortier, & Guay, 1997; Vecchione, Alessandri, & Marsicano, 2014). Also, motivation develops over time (Pan & Gauvain, 2012); e.g. research focusing on the first year in higher education reports a gradually increase of autonomous motivation (Kyndt et al., 2015). However, it is not clear how it develops throughout a whole academic career as longitudinal research in this area is lacking. Furthermore, cultural context seems to be an aspect that also shapes motivation (Guay, 2016).

**Self-efficacy**

A closely to motivation-related concept is that of self-efficacy. Students’ self-efficacy is mostly related to confidence, it refers to ‘the beliefs in one’s capabilities to organize and execute the courses of action required to manage prospective situations’ (Bandura, 1995, p. 2) and, overall, contributes significantly to human attainments (Bandura, 1992). Within simulations it can, for example, easily be connected to the amount of belief students have in their negotiating skills. A strong belief in one-self generates a feeling of competence that is motivating for engagement (Zepke, Leach, & Butler, 2010). Moreover, it promotes further skill development and helps to engage and to persist in tasks, especially when encountering difficulties (Bandura, 1986, 1997). Therefore, simulation-attending students that are more convinced of their negotiating skills thus feel more competent and probably are more resilient to overcome difficult times during the negotiations. Overall, within higher education self-efficacy plays a predicting and mediating role in relation to academic success, also by positively influencing students’ regulative learning outcomes (Bandura, 1997; Coutinho & Neuman, 2008; Donche & Van Petegem, 2010; Richardson et al., 2012; van Dinther et al., 2011; Zimmerman, 2000).

Trying to identify factors that influence students’ self-efficacy, previous research reveals that the amount of experiences is related to students’ self-efficacy (Cassidy & Eachus, 2002; Tang, Addison, LaSure-Bryant, & Norman, 2004). This results in more experienced students reporting more self-efficacy. In general, female students perform as capable as male students in various academic domains. However, they may report lower self-efficacy, especially at higher academic levels (Schunk & Pajares, 2008). Also, self-efficacy is shaped by the cultural context (Guay, 2016).
Interest

Interest is related to motivation because it also drives student learning. However, an important difference is that interest is the result of an interaction between the student and a particular content (Hidi & Renninger, 2006). This implies that interest is, even more than motivation, related to the simulation context, topic and content. The approach to the concept of interest within the research field of political science education is similar to that of motivation. Also, to prove effectiveness, students are usually asked how the simulation influenced their interest in general or in the course subject also using either quantitative or qualitative measures (Arnold, 2014; Bridge & Radford, 2014; Roper, 2004; Zaino & Mulligan, 2009). However, interest is also not a unitary concept and can be distinguished in individual interest, which is enduring and context-general, and situational interest, which is spontaneous and context-specific (Hidi & Renninger, 2006; Rotgans, 2015; Schraw & Lehman, 2001). Individual interest is a more or less stable type of interest that slowly develops over time (Hidi & Renninger, 2006; Rotgans, 2015). Political science students can for example have a deep-seated, individual interest in international politics, or the European Union, or migration issues etc. This type of interest facilitates the engagement and reengagement with particular content over time (Hidi & Renninger, 2006; Rotgans, 2015). Hence, a strong individual interest for international politics may lead to students frequently attending Model United Union (MUN)-simulations all over the world. Or, if the student has an individual interest for migration policy, this may lead to only attending simulations that put these issues on the agenda.

On the contrary, situational interest is a fleeting type of interest that is triggered by environmental aspects (Hidi & Renninger, 2006; Rotgans, 2015). The use of games in the classroom e.g. Prisoner’s Dilemma (Asal et al., 2014) may arouse students’ situational interest by presenting them a puzzling problem. However, this type of interest is not stable and changes as situational conditions change. Within simulations, situational interest probably, as it is not emperically proven yet, fluctuates, depending on situational circumstances e.g. how well are negotiations going for your country, can you get your point come across, do you feel confident speaking in public, is the chair a nice person etc.

Similar to autonomous motivation and self-efficacy, also interest is an important predictor of academic achievement (Rotgans & Schmidt, 2011b; Schiefele et al., 1992;
Schiefele et al., 1995) and regulative learning outcomes (Rotgans & Schmidt, 2011b; Schiefele et al., 1995). Because both types of interest are related to a specific content and/or context, it is valuable to take both types of interest into account when evaluating the effectiveness of simulations.

This study

The importance of affective learning outcomes in relation to academic achievement and regulative learning outcomes has been stated. Therefore, these outcomes are valuable to investigate as possible simulation outcomes. More specifically, affective learning outcomes are in this study defined as: autonomous motivation, self-efficacy, and situational and individual interest. Overall, this study aims to explore how students attending a simulation differ in their affective learning outcomes. Therefore, the central research question in this study is: How do students differ in their affective learning outcomes, based on their student characteristics? Based on previous research the following students characteristics are taken into account: students’ age, gender, and field of study. Next, location of the university is included as possible influence of cultural context. Students’ experiences are measured in their number of years of higher education, number of years attending the same simulation, and the broader learning environment: did they had a class preparation or not.

Research context and sample

This research was conducted during a 4-day cross-continental simulation, called EuroSim. This simulation brings together students from different American and European universities, including from different fields of study. Therefore, this context is mostly suited to investigate possible differences between students. Data were collected after a plenary lecture on the second day of the simulation. 139 out of the 180 attending students completed the questionnaire. This is a response rate of 77.22%. Incomplete data were received from three students (N=136; M age = 21.63; SD = 2.71). Additionally, based on the standard deviation of ‘Age’ four outliers were detected. As these seven cases involved less than ten per cent of the total sample, a listwise deletion (Byrne, 2010) was used (N=132). Furthermore, descriptive statistics for all student characteristics are presented in Table 1. For ‘Field of study’ we could distinguish 5 categories of majors. More than 75% of our sample has a direct link with politics (in general, international or European). ‘Number of Years in Higher Education’ was divided
into two groups, with a cut point on 3 years, based on the bachelor-master structure. Most of the students attended the simulation for the first time (72%).

Tabel 1

*Descriptive statistics for all student characteristics included in this study (132 students)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>21.37</td>
<td>2.30</td>
<td>132</td>
<td>100</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>60</td>
<td></td>
<td>45.45</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>72</td>
<td></td>
<td>54.55</td>
<td></td>
</tr>
<tr>
<td>Location of the university</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EU</td>
<td>70</td>
<td></td>
<td>53.03</td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>62</td>
<td></td>
<td>46.97</td>
<td></td>
</tr>
<tr>
<td>Field of Study</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political sciences</td>
<td>52</td>
<td></td>
<td>39.39</td>
<td></td>
</tr>
<tr>
<td>International relations</td>
<td>31</td>
<td></td>
<td>23.49</td>
<td></td>
</tr>
<tr>
<td>European studies</td>
<td>22</td>
<td></td>
<td>16.67</td>
<td></td>
</tr>
<tr>
<td>Law</td>
<td>16</td>
<td></td>
<td>12.12</td>
<td></td>
</tr>
<tr>
<td>Other (e.g. media, history, economics...)</td>
<td>11</td>
<td></td>
<td>8.33</td>
<td></td>
</tr>
<tr>
<td>Class Preparation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>80</td>
<td></td>
<td>60.61</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>52</td>
<td></td>
<td>39.39</td>
<td></td>
</tr>
<tr>
<td>Number of Years in higher education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 3 years</td>
<td>2.06</td>
<td>.79</td>
<td>79</td>
<td>59.85</td>
</tr>
<tr>
<td>≥ 4 years</td>
<td>4.87</td>
<td>1.04</td>
<td>53</td>
<td>40.15</td>
</tr>
<tr>
<td>Number of Years attending EuroSim</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 year</td>
<td>95</td>
<td></td>
<td>71.97</td>
<td></td>
</tr>
<tr>
<td>&gt; 1 year</td>
<td>37</td>
<td>.62</td>
<td>28.03</td>
<td></td>
</tr>
</tbody>
</table>

*Measurements*

A questionnaire was developed using existing and, for higher education, validated scales. To measure affective learning outcomes the following scales were used: autonomous motivation (SRQ-A; Ryan & Connell, 1989; Vanthournout, Gijbels, Coertjens, Donche, &
Van Petegem, 2012), individual interest (IIQ; Rotgans, 2015), situational interest (SIQ; Rotgans & Schmidt, 2011a; Rotgans & Schmidt, 2011b, 2014), and self-efficacy (ILS-SV; Donche & Van Petegem, 2008).

The items of the different scales were constructed with regard to a specific relevant topic. Hence, ‘autonomous motivation’ was to be answered in relation to students’ field of study (8 items; e.g. ‘I’m motivated for my field of study because I want to learn new things). Next, for ‘individual interest’ all items were related to students’ general interest for the European Union (7 items; ‘I am very interested in the European Union, including issues of negotiation and decision-making). ‘Situational interest’ was measured with regard to negotiating, decision-making, or refugee and asylum policy (6 items; e.g. ‘At this moment I think this topic is interesting’). Students were asked to choose one topic in relation to which their situational interest was reported. Finally, ‘self-efficacy’ was measured for negotiating because this was the core skill needed during the simulation (4 items; ‘I think I’m a good negotiator’).

Although all used subscales have been validated in previous research, because of their use in a new context of simulations a confirmatory factor analysis (CFA) was conducted for all separate scales. Next, also internal consistency was measured for all subscales, including the corrected item-total correlation for all items. The χ² test of exact fit, the comparative fit index (CFI), root mean square error of approximation (RMSEA) and standard root mean square (SRMR) were used. A CFI-value greater than or equal to .90 and SRMR- and RMSEA-value less than or equal to .08 are considered as indicators for a model with adequate fit. Additionally, a CFI-value greater than or equal to .95, SRMR-value less than or equal to .06 and RMSEA-value less than or equal to .05 are indicators for a model with excellent fit (Hu & Bentler, 1999). For the scale ‘autonomous motivation’ the χ² test of exact fit is statistically significant at the .05-level, whereas the objective is to achieve a non-significant p value. However, Hatcher (1994) indicates that a statistically significant χ² does not make a confirmatory analysis model inadequate. Therefore, the χ² test of exact fit should always be combined with other fit indices, such as RMSEA, CFI and SRMR (Marsh, Balla, & McDonald, 1988; Schumacker & Lomax, 2004) Hence, the findings are within acceptable limits as the other fit indices indicate a model with adequate to excellent fit for each scale (Table 2).

Overall, the results of the various validity and reliability tests are very satisfying. All target loadings are large (between .466 and .898) and statistically significant.
(p<.001). Also, the scale composite reliability values of the various factors are higher than .80 (Bagozzi & Yi, 1988) and the extracted variances show that each factor explains at least 41% of the variance in the posited items. These findings support the internal consistency and the factor structure of each scale.

Finally, correlations and descriptive statistics for all dependent variables are presented in Table 3. These findings confirm all measured constructs are interrelated, which confirms there relatedness as affective learning outcomes. However, all of the correlations are low enough (r < .80) to consider them as different constructs.

Table 2

CFA results for all separate scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Factor loadings</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p</th>
<th>CFI</th>
<th>RMSEA</th>
<th>SRMR</th>
<th>$\rho_c$ *</th>
<th>Variance extracted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomous motivation</td>
<td>.466 - .831</td>
<td>27.24</td>
<td>16</td>
<td>.04</td>
<td>.97</td>
<td>.07</td>
<td>.04</td>
<td>.84</td>
<td>.41</td>
</tr>
<tr>
<td>Individual interest</td>
<td>.534 - .843</td>
<td>15.56</td>
<td>11</td>
<td>.16</td>
<td>.99</td>
<td>.06</td>
<td>.04</td>
<td>.85</td>
<td>.46</td>
</tr>
<tr>
<td>Situational interest **</td>
<td>.505 - .896</td>
<td>6.27</td>
<td>5</td>
<td>.28</td>
<td>.99</td>
<td>.04</td>
<td>.03</td>
<td>.82</td>
<td>.49</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>.802 - .898</td>
<td>.27</td>
<td>2</td>
<td>.88</td>
<td>1.00</td>
<td>.000</td>
<td>.00</td>
<td>.91</td>
<td>.71</td>
</tr>
</tbody>
</table>

* Cronbach’s alpha results were similar with a range from .80-.91; ** Based on previously conducted CFA-analysis (Factor loading SI5 = .383; $\chi^2=27.63$, df=9, p=.00; CFI=.93; RMSEA=.13; SRMR=.07), item SI5 was excluded from this and further analyses

Table 3

Descriptive statistics and Pearson correlations

<table>
<thead>
<tr>
<th>Scale</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Autonomous motivation</td>
<td>4.24</td>
<td>.57</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Individual interest</td>
<td>3.22</td>
<td>.77</td>
<td>.350***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Situational interest</td>
<td>3.42</td>
<td>.45</td>
<td>.317***</td>
<td>.381***</td>
<td></td>
</tr>
<tr>
<td>4. Self-efficacy</td>
<td>3.47</td>
<td>.84</td>
<td>.284***</td>
<td>.169*</td>
<td>.224**</td>
</tr>
</tbody>
</table>

***p ≤ .001, **p ≤ .01, *p ≤ .05
Plan of analysis

To explore student differences one-way ANOVA analyses\(^1\), more specifically several independent t-tests, were conducted. We compared means for each subscale in the following different conditions: age, gender, location of the university, class preparation, number of years attending EuroSim, and number of years in higher education.

Results

Gender

Male students (\(M=3.73; sd=.71\)) scored significant higher on self-efficacy for negotiating than female students (\(M=3.25; sd=.88\)); \(t(129.93)=3.44; p=.001\)). Furthermore, female students (\(M=3.53; sd=.43\)) scored significant higher on situational interest than male students (\(M=3.30; sd=.44\)); \(t(130)=2.99, p=.003\); Cohen’s \(d=0.53\)). All other results were non-significant.

Location of the University

Students of a European University scored only significant higher on individual interest for the EU, compared to students of an American University (Table 4). Students of an American University scored significant higher on autonomous motivation for their field of study and self-efficacy for negotiating. There were no significant differences for situational interest.

Table 4

<table>
<thead>
<tr>
<th></th>
<th>EU</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Autonomous motivation</td>
<td>4.08</td>
<td>.56</td>
</tr>
<tr>
<td>Individual Interest</td>
<td>3.44</td>
<td>.70</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>3.31</td>
<td>.80</td>
</tr>
</tbody>
</table>

Class preparation

Results showed a significant difference for individual interest. Students who had a preparation class (\(M=3.39; sd=.72\)) scored significant higher on their individual

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\(^1\) A Shapiro-Wilk test and Levene’s test were used for checking the underlying assumptions of normal distribution and homogeneity. When findings were significant, respectively a Mann-Whitney U test or ANOVA Welch’s test were conducted, which revealed similar results or, otherwise, differences are reported in the result section.

\(^*\) Equal variances not assumed.
interest in the EU than students who didn’t have class preparation ($M = 2.95; sd = .78$); $t (130)=3.32, p = .001$; Cohen’s $d = .59$). All other differences were non-significant.

**Number of years attending EuroSim**

For this condition, the difference was measured between students who attended EuroSim for the first time and those who attended already more than once. Students, who attended EuroSim for at least the second time, showed to have more self-efficacy for negotiating and more autonomous motivation for their field of study. However, those students did not have more individual interest in the EU (Table 5).

Table 5

<table>
<thead>
<tr>
<th></th>
<th>1 year</th>
<th>&gt; 1 year</th>
<th>df</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomous motivation</td>
<td>4.18</td>
<td>.55</td>
<td>132</td>
<td>.045</td>
<td></td>
</tr>
<tr>
<td>Individual Interest</td>
<td>3.31</td>
<td>.68</td>
<td>132</td>
<td>1.94</td>
<td>.028</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>3.32</td>
<td>.86</td>
<td>132</td>
<td>-3.63</td>
<td>.000</td>
</tr>
</tbody>
</table>

* Reported results are only confirmed in Mann-Whitney U test ($z = -2.01$); ** Equal variances not assumed; reported results are not confirmed in ANOVA Welch’s test (Welch’s $F (1, 51.74) = 3.75, p = .06$); *** Equal variances not assumed

**Age and Number of years in higher education**

No significant differences were found based on students’ age. However, results showed that students who already attended higher education for four or more years ($M = 3.40; sd = .75$) scored significant higher on individual interest for the EU than students who attended just three years or less ($M = 3.10; sd = .77; t (130) = 2.22; p = .028; Cohen’s $d = .39$). There were no other significant differences.

**Conclusion and discussion (first draft)**

First results show that different student characteristics indeed relate to different affective learning outcomes. However, it also raises questions, more specifically about the simulation process and the part a simulation plays in a broader learning environment. As this study uses one measurement, no causal conclusions can be drawn. We consider simulations as a rich learning environment that needs further exploring. Not only the relationship between student factors and learning outcomes, but also more
information about the learning process seems to be needed to be able to know more about their effectiveness.

The scales used in this study are suitable for measuring affective learning outcomes in simulations contexts. The use of similar instruments would facilitate better comparison of different future research outcomes. However, the sample in this study may be considered as too small to be able to validate a questionnaire that consists of different scales. Therefore, research with larger samples is necessary.

References


