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ABSTRACT

Individual student success is influenced by the educational environment and student characteristics. One adaptation of the educational environment to improve student success is the introduction of continuous, or in-course, assessment. Previous research already identified several student characteristics that are related to student success as measured by student achievement, like previous achievements, motivation, self-efficacy and gender. The two facets are investigated in a group of first-year undergraduate Law students in the Netherlands, by examining the relationship of different types of continuous assessment and student characteristics with academic achievement. A questionnaire, measuring demographic information, self-regulation and motivational constructs, was completed by 94 students and their grades were requested from the student administration. Repeated measures ANCOVAs with assessment type as the within-subject factor identified that student achievement is not dependent on the type of continuous assessment. Students with higher high-school GPAs got higher scores across assessment types. Male students performed worse than their female peers in courses without continuous assessment, but in courses using any type of continuous assessment, this gender difference disappeared. Intrinsic motivation was a negative predictor of achievement in courses using writing assignments and mandatory homework assignments. Results from the current study indicate that continuous assessment may be a potent measure to improve male students' success by closing the gender achievement gap, and that students with high levels of intrinsic motivation do not benefit from continuous assessment.

Introduction

Student success in higher education has been a topic of interest for several decades (e.g., McKenzie & Schweitzer, 2001; Pascarella & Terenzini, 1991). Prior to this, Tinto (1975) started to develop his model on student drop out, and Feldman and Newcomb (1969)

investigated how college education affects student outcomes. Yet student success is still a topic of research and is defined in many ways. Studies in the Netherlands have used drop out (van den Bogaard, 2012), study progress (Kamphorst, Hofman, Jansen, & Terlouw, 2013; van den Bogaard, 2012), and perceived competence (Kamphorst et al., 2013) as definitions. Some other examples are employability (Qenani, MacDougall, & Sexton, 2014), or academic achievement (McKenzie & Schweitzer, 2001). Research on student success is not just about operationalisation, but also about what variables influence student success. Student success can be influenced by the *university environment* (e.g., van Berkel, Jansen, & Bax, 2012), *student characteristics* (e.g., Richardson, Abraham, & Bond, 2012) or both. Van Berkel et al. focus on student success in terms of graduation rates, and Richardson et al. in terms of GPA. However, Qenani et al. (2014) pose that employability can also be influenced by factors in the university environment as well as in students. In the current article, we will focus on academic achievement as a measure of student success and investigate the university environment as well as student characteristics as explaining factors for academic achievement.

The university environment and student success

Several facets of the university environment can play a role in student success. Tinto's (1975) model, for example, focuses on interactions between students and faculty. Additionally, Thomas (2002) posits that what she terms *institutional habitus*, the norms and practices of the institution, can influence student retention, and that retention is greatest when students' habitus corresponds with the institutional habitus. According to van Berkel et al. (2012), it is a university's responsibility to shape the curriculum in a way that optimises student success. In their book, several curriculum optimisation measures are presented, like preventing competition of several different course activities, introducing active learning activities and adjusting the assessment program. The current article will explore this final measure, and more specifically, the use of continuous assessment, since previous research has shown that an adjusted assessment programme is a potent driver of student learning (Cohen-Schotanus, 1999). Furthermore, using a 'range of assessment tools' is also one of the measures for adapting the institutional habitus proposed by Thomas (2002, p. 439).

Continuous assessment refers to the use of one or several assessments during the course period, instead of a single final exam in the last weeks of the semester. It is also referred to as frequent assessment (e.g., Rezaei, 2015). Continuous assessment in higher education can be used to improve student learning (e.g., Rezaei, 2015) as well as student engagement (e.g., Holmes, 2015). In both cases, continuous assessment can be used to provide feedback to students (e.g., de Kleijn, Bouwmeester, Ritzen, Ramaekers, & Van Rijen, 2013) and teachers (e.g., Domenech, Blazquez, de la Poza, & Munoz-Miquel, 2015). Furthermore, continuous assessment can be used as a reward system for desired studying behaviour (Admiraal, Wubbels, & Pilot, 1999), which also relates to the cognitive principle of reinforcement learning (Daw & Frank, 2009). Additionally, several of Gibbs and Simpson's (2004) conditions that assessment must meet to support learning correspond to factors of continuous assessment. In a previous study (Day, van Blankenstein, Westenberg, & Admiraal, 2017) we indicate that, at our institution, university teachers employ continuous assessment to keep students working during the course period and to be able to assess

different knowledge and skills. With this second goal in mind, it is apparent that continuous assessments can have different types, like essays, presentations, as well as partial exams. Continuous assessments can be either voluntary or mandatory. However, using voluntary assessments may promote self-selection. Thomas et al. (2017), for example, were unsure whether increased usage of online self-tests could explain higher grades, or whether high achieving students chose to use self-tests more often. To overcome this problem with self-selection, in the current study a constraint for continuous assessment is that the assessment is mandatory and completion is checked by the teacher.

Continuous assessment has two main cognitive benefits. First, there is the testing effect (Roediger & Karpicke, 2006) which states that repeated testing of information leads to better retention of this information. According to Butler (2010), the testing effect also extends to final assessments with new information, denoting a transfer of knowledge. The second benefit can be referred to as the spacing effect (Kornell, 2009), spreading your studying across the study period leads to longer retention than last minute cramming does. Dunlosky, Rawson, Marsh, Nathan, and Willingham (2013) cited evidence from the lab and the classroom and stated that practice testing (testing effect) and distributed practice (spacing effect) are the most beneficial study methods. Furthermore, continuous assessment leaves students with time to reflect on their learning and their results. According to Moon (1999), 'reflection makes deeper and better considered knowledge available to us' (p. 155).

Several studies have found that using continuous assessment in higher education courses improves student achievement (e.g., Domenech et al., 2015; Nelson, Robison, Bell, & Bradshaw, 2009; Tuunila & Pulkkinen, 2015). However, this research usually does not contrast different types of continuous assessment. Therefore, there is no information on whether some types of continuous assessment are more beneficial to student achievement than others.

In sum, continuous assessment can lead to more effective study behaviour and promote student academic achievement. After discussing continuous assessment as a change in the educational environment to promote student success, we now continue with the role student characteristics play in academic achievement.

Student characteristics and student success

Research into the relationship between student characteristics and academic achievement has identified a wide variety of predictors. Student characteristics include motivational constructs, previous achievement and more demographic information. McKenzie and Schweitzer (2001), for example, found that previous achievement, self-efficacy and whether students had a job were significant predictors of academic achievement. An oft-cited article discussing student characteristics related to academic achievement is the meta-analysis by Richardson et al. (2012). This meta-analysis identified 41 characteristics that are correlated with academic achievement. These were cognitive characteristics, like high-school GPA, as well as non-cognitive characteristics, like motivation and self-regulation. To narrow down the list of correlates, the current article focus is on the strongest correlates which are high-school GPA, academic self-efficacy, effort regulation and performance self-efficacy, showing medium-to-large correlations. In addition, we focus on a few of the conceptually related smaller correlates like learning goal orientation,

academic intrinsic motivation and metacognition. Furthermore, we also include gender, a small correlate in Richardson et al.'s study.

Continuous assessment and student characteristics

Continuous assessment and student characteristics can influence academic achievement independently, but they can also influence each other. Possible interplays between continuous assessment and student characteristics are specifically interesting in the light of optimising the curriculum for student success. When different groups of students get different benefits, this may present a case for more individualised assessment paths.

The most apparent case that continuous assessment and student characteristics relate to each other may be that of students who lack the self-regulation skills for independent study throughout the semester. Teachers and students praised the fact that continuous assessments help to keep students on track (Day et al., 2017) and in Peat and Franklin's (2002) study, students remarked mainly on using self-assessment modules as learning guides and not as assessment tools.

Looking at student ability and continuous assessment, research shows that higher achieving students benefit more from intermediate exams (De Paola & Scoppa, 2011) or that lower achieving students perform better each continuous assessment, while higher achieving students started regressing to the mean (Kerdijk, Tio, Mulder, & Cohen-Schotanus, 2013).

When relating motivation to continuous assessment and achievement, Ibabe and Jauregizar (2010) found that students with higher motivation made more use of the online self-assessment tool and that students who used the tool had higher achievement. However, even students with lower motivation levels used online self-assessment.

Several researchers have looked at gender differences in academic achievement. When looking at general achievement, Richardson et al. (2012) identified that female students perform better than their male peers. In the case of continuous assessment, this picture is less clear. Domenech et al. (2015) found no significant gender differences for students taking frequent cumulative tests. However, they discerned a trend where women got higher grades but men had higher exam passing rates. Research by Cano (2011) suggests that when students have the opportunity to choose whether they want to participate in continuous assessments, women more often opt-in than men. Furthermore, female engineering students rate themselves and their female peers lower on peer and self-assessment tasks than their male counterparts do (Torres-Guijarro & Bengoechea, 2017).

To summarise, there seems to be interplay between continuous assessment and several student characteristics. Unfortunately, this relationship is still largely unclear. Therefore, in the current study, we try to answer the following two research questions:

(1) To what extent does the type of continuous assessment relate to academic achievement?
(2) What role do gender, high-school achievement, motivation and self-regulation play in this relationship?

Methods

Context

The study was conducted during the 2014–2015 academic year at the undergraduate law school of a research university in the Netherlands. This law school offers bachelor degrees in Criminology, Law, Fiscal Law, Notarial Law, Business, International Business Law, and Law and Economics. During the first year, which is a foundation year, the majority of courses are the same for all law majors and about 45% of courses is also a part of the criminology program. A full overview of the courses in the program and, when applicable, their continuous assessment, can be found in Table 1. To reiterate, continuous assessments are checked for completion by teachers, assessments that are graded are marked in the table. Courses without continuous assessment generally do have required readings or homework assignments, but there is no check to see if these are actually completed. All course information was gathered from the university's e-prospectus. Both majors take courses amounting to 1680 hours of study work.

Participants

Ninety-four first-year students (42.6% male) completed the full questionnaire. The majority of students majored in Law (64.9% Fiscal, Notarial or Law, 24.5% other), whereas only 8% were Criminology majors. Over three quarters (77.7%) of students were 18 or 19 years old, with the remainder of students being older. Eighty-one per

Table 1. Overview of the first-year courses in the 2014–2015 academic year, their continuous assessment and final exam results.

Course no. and description of the continuous assessment	Major	N	M (SD)
LLP	L + C		
1. –	L + C	85	7.06 (1.21)
2. Short written assignment(s)	L + C	86	5.73 (1.09)
3. Partial exam (case, open ended)[a]	L	79	6.03 (1.37)
4. Homework assignments (e.g., debate, plea, case)	L + C	85	5.66 (1.23)
5. –	L	76	5.61 (1.59)
6. –	L	79	7.06 (1.15)
7. Short written assignment(s)	L + C	89	7.29 (1.30)
8. Written assignment[a,b]	L	38	7.63 (0.91)
9. Written assignment[a,b]	L	16	7.19 (0.75)
10. Three written assignments[a,b]	L	1	8.00 (–)
11. Written assignment[a,b]	L	13	6.23 (1.01)
12. –	L	74	5.78 (1.17)
13. –	L	74	6.32 (1.26)
14. –	L	72	6.85 (1.07)
15. Portfolio of homework assignments[a]	C	8	6.38 (0.74)
16. Presentation, prepositions, mini-experiment and report	C	8	5.75 (1.40)
17. Written assignments[a]	C	8	5.88 (0.64)
18. Partial exam (essay questions), presentation[a]	C	7	6.63 (1.41); 5.86 (1.57)
19. Paper based on interview[a]	C	7	6.29 (1.11)
20. Three written assignments	C	7	7.29 (0.76)

Note: C: Criminology; L: Law.
[a]Denotes courses where the continuous assessment counts towards the overall grade.
[b]Course 8 is taken by Law, Fiscal Law and Notarial Law majors, Course 9 is taken by Business majors, Course 10 is taken by Economic majors, Course 11 is taken by International Business Law majors.

cent of students are of Dutch origin and almost 90% entered undergraduate studies directly after high school.

Materials

Student characteristics

Demographics, self-regulation and motivation were measured using a slightly adapted version of the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia, & Mckeachie, 1993). The following eight scales were used: Intrinsic Goal Orientation, Extrinsic Goal Orientation, Task Value, Control of Learning Beliefs, Self-Efficacy of Learning and Performance, Time and Study Environment, Metacognitive Self-Regulation and Effort Regulation. All questions were translated to Dutch based on the translation used by Blom, Severiens, Broekkamp, and Hoek (2004) and adapted to be applicable to the whole course program instead of one specific course. A translation back-translation procedure was used to check the accuracy of the translated items. All items were answered on a Likert scale ranging from 1 (*not at all applicable to me*) to 5 (*very applicable to me*). The eight MSLQ scales encompassed a total of 50 questions. Table 2 shows an overview of the reliabilities of the scales. In addition to the 50 MSLQ questions, students were asked to answer questions about their major, age, cultural background, high-school exam grade and prior education. For all these questions, the expected most frequent answers were supplied as multiple choice options, with an open ended 'other' option added.

Student achievement

To get a measure of student achievement, first-try final exam grades were collected from the student administration. Based on the assessment type they use, the courses can be classified into six groups. These are: 'no continuous assessment' (course $N = 6$), 'written assignment(s)' ($N = 8$), partial exam ($N = 2$), 'mandatory homework assignments' ($N = 2$), 'interview and paper' ($N = 1$) and 'presentation, proposition and mini-experiment' ($N = 1$). For each of these groups, an average grade on all courses was calculated as a composite score.

Procedure

The questionnaire was handed out during the coffee break of a lecture of Course 7, where approximately 275 students attended (response rate 34.2%). This course was chosen

Table 2. Reliabilities and mean scores for motivated strategies for learning questionnaire scales.

MSLQ Scale	Item N	Reliability	M (SD)
Intrinsic Goal Orientation	4	0.654[a]	3.53 (0.55)
Extrinsic Goal Orientation	4	0.710[a]	3.57 (0.64)
Task Value	6	0.731	3.98 (0.42)
Control of Learning Beliefs	4	0.755[a]	3.83 (0.57)
Self-Efficacy of Learning and Performance	8	0.819	3.75 (0.51)
Time and Study Environment	8	0.702	3.65 (0.57)
Effort Regulation	4	0.748[a]	3.63 (0.65)
Metacognitive Self-Regulation	12	0.640	3.20 (0.43)

[a]Spearman–Brown predicted reliability for scale length six items.

because it is taught to all majors simultaneously and takes place during the second semester of the academic year. Therefore, students already had a full impression of what their major was like, and early drop outs were not going to participate in the research. The objectives of the study were introduced briefly before the break in a plenary announcement by the first author.

Ethics

The current research was approved by the ethical committee of the psychology department of our university. The first page of the questionnaire was an informed consent letter that explained additional information about the research and asked students' permission to access their grades. A translated version of the consent letter can be found in the supplementary online materials. Students were asked to fill in their student ID number, to be able to connect questionnaire data to student results, but confidentiality of results was guaranteed. Only questionnaires including a signed consent form were included in the study.

Results

Descriptive statistics

Mean exam scores for the courses can be found in Table 1, and mean scores on all MSLQ scales can be found in Table 2. Mean scores for the assessment-type composite scores can be found in Table 3. The composite scores for interview and presentation were excluded from further analysis since both have a student N lower than 10.

Preliminary regression analyses

Hierarchical regression analyses were run for each assessment-type composite score individually to investigate which predictors were related to achievement. Variables were included in the model based on the article by Richardson et al. (2012). The strongest predictors high-school GPA, self-efficacy and effort regulation were added in the first step. The weaker correlates gender, age, intrinsic goal orientation, extrinsic goal orientation, task value, metacognitive self-regulation, and time and study environment were included in the second step. The third and final step included the variable control of learning beliefs, which is not discussed by Richardson et al. Outcomes (not pictured) show that the only significant predictors were High-School GPA, Intrinsic Goal Orientation, Task Value

Table 3. Descriptive statistics for assessment-type composite scores.

Assessment-type composite score	Course N	Student N	M (SD)
No continuous assessment (Courses 1, 5, 6, 12, 13, 14)	6	89	6.39 (0.95)
Written assignment (Courses 2, 7, 8, 9, 10, 11, 17, 20)	8	89	6.68 (0.91)
Partial exam (Courses 3, 18)	2	87	6.04 (1.35)
Mandatory homework assignment (Courses 4, 15)	2	85	5.73 (1.15)
Interview and paper (Course 19)	1	7	6.29 (1.11)
Presentation, proposition, mini-experiment (Course 16)	1	8	5.75 (1.39)

Note: Course numbers for each assessment-type composite score correspond to course numbers in Table 1.

and Gender. These four variables were added to the repeated measures ANCOVAs as between-subjects variables.

Student characteristics, assessment type and student achievement

To fully investigate the relationship between student characteristics, assessment characteristics and student performance, two repeated measures ANCOVAs were conducted. To be able to fully investigate the relationship between the different variables, individual regression parameters were requested in SPSS.

Contrasting courses with and without continuous assessment

In the first analysis, investigating the role of student characteristics in courses with and without continuous assessment, the within-subject variable assessment had two levels. The between-subject variables were high-school GPA, intrinsic goal orientation, task value and gender, the latter of the four is dichotomous, the other variables are continuous and therefore added as covariates.

Results from this analysis indicate that students' achievement is not dependent on whether their course has continuous assessment, $F(1, 79) = .021$, $p > .05$. Main effects were found for three variables. First, high-school GPA, $F(1, 79) = 36.09$, $p < .001$, partial $\eta^2 = .314$, which indicates that students' who had higher previous achievement also have higher achievement in university. Second, intrinsic goal orientation, $F(1, 79) = 7.10$, $p = .009$, partial $\eta^2 = .084$ where higher levels of intrinsic goal orientation lead to lower achievement. The third and final significant main effect is that of gender, $F(1, 79) = 5.28$, $p = .023$, partial $\eta^2 = .064$ indicating that female students perform better than their male peers. This gender effect, however, is characterised by an assessment by gender interaction effect, $F(1, 79) = 7.68$, $p = .007$, partial $\eta^2 = .089$ where there is only a gender difference on courses that do not have a continuous assessment. For courses that do have continuous assessments, there is no difference in score for men and women. The individual influence of each variable on the two types of courses can be found in Table 4.

Investigating the three types of continuous assessment

We subsequently ran another Repeated Measures ANCOVA, with a three-level within-subject variable to investigate whether there are different outcomes for different assessment types. The three levels were *written assignments*, *partial exam* and *mandatory*

Table 4. Parameter estimates for ANCOVA comparing courses with and without continuous assessment.

Use of continuous assessment	Parameter	B	SE	t	p	Partial η^2
No continuous assessment	Intercept	2.24	1.10	20.3	.046	.050
	High-School GPA	0.80	0.15	5.49	<.001	.276
	Male Gender	−0.57	0.18	−3.17	.002	.113
	Intrinsic Goal Orientation	−0.40	0.17	−2.35	.021	.065
	Task Value	0.05	0.24	0.22	.829	.001
Continuous assessment	Intercept	2.16	1.06	2.05	.044	.05
	High-School GPA	0.77	0.14	5.50	<.001	.277
	Male Gender	−0.18	0.17	−1.02	.311	.013
	Intrinsic Goal Orientation	−0.43	0.16	−2.58	.012	.078
	Task Value	0.08	0.23	0.36	.718	.002

Table 5. Parameter estimates for ANCOVA comparing the three assessment-type composite scores.

Assessment-type composite score	Parameter	B	SE	t	p	Partial η^2
Written assignment	Intercept	2.55	1.05	2.42	.018	.073
	High-School GPA	0.76	0.14	5.47	<.001	.285
	Male Gender	−0.19	0.17	−1.11	.270	.016
	Intrinsic Goal Orientation	−0.48	0.16	−2.94	.004	.103
	Task Value	0.17	0.24	0.69	.490	.006
Partial exam	Intercept	0.06	1.76	0.04	.97	<.001
	High-School GPA	1.01	0.23	4.36	<.001	.202
	Male Gender	−0.46	0.29	−1.63	.108	.034
	Intrinsic Goal Orientation	−0.52	0.27	−1.90	.062	.046
	Task Value	0.24	0.40	0.60	.551	.005
Mandatory homework assignment	Intercept	2.27	1.51	1.50	.14	.029
	High-School GPA	0.91	0.20	4.57	<.001	.217
	Male Gender	−0.25	0.25	−1.00	.319	.013
	Intrinsic Goal Orientation	0.12	0.24	0.50	.616	.003
	Task Value	−0.83	0.34	−2.42	.018	.072

homework assignments. The same four between-subject variables as in the previous analysis were included.

The assumption of sphericity was violated for assessment type, $\chi^2(2) = 18.62$, $p < .001$; therefore, Huynh–Feldt estimates of sphericity were used to correct the degrees of freedom ($\varepsilon = .88$).

There was still no main effect of assessment type $F(1.76, 131.76) = 1.49$, $p > .05$, indicating that students scored similarly on courses with different assessment types.

There was a main effect of high-school GPA $F(1, 75) = 37.26$, $p < .001$, partial $\eta^2 = .332$ indicating that a higher high-school GPA was related to higher university grades. There is no main effect of gender in this analysis, $F(1, 75) = 2.78$, $p > .05$, which shows that men's scores do not differ from those of their female peers across all three continuous assessment types.

There were no main effects for intrinsic goal orientation and task value, but both these variables interacted with the assessment type, $F(1.76, 131.76) = 3.79$, $p = .03$ and $F(1.76, 131.76) = 4.95$, $p = .011$, respectively. Investigation of the parameter estimates indicates that intrinsic goal orientation is a negative predictor of students' grades on courses with written assignments, suggesting that students with higher levels of intrinsic goal orientation for their Law program get lower grades for these courses. This contrasts with the result from the comparison of courses with and without continuous assessment, where intrinsic goal orientation was a negative predictor for all courses. Task value is a negative predictor of students' grades on courses with mandatory homework assignments, again suggesting that students who have a higher task value of their studies score lower on courses with mandatory homework. A full overview of all parameter estimates for each assessment-type composite score can be found in Table 5.

Discussion

This article focused on two research questions. The first was to what extent the type of continuous assessment relates to academic achievement, and the second investigated the role of gender, high-school achievement, motivation and self-regulation in this relationship.

Results from the current study indicate that the type of continuous assessment does not influence academic achievement. This result suggests, first of all, that students do not perform differently depending on whether they need to complete written assignments, a partial exam or homework assignments.

However, the second suggestion of the lack of a main effect of assessment type is that students do not perform better on courses whether these courses use continuous assessment or not. This contrasts with previous research that discovered that, in most cases, continuous assessment positively influences students' achievement (e.g., Domenech et al., 2015; Ibabe & Jauregizar, 2010; Rezaei, 2015). A possible explanation for the lack of results is the structure of the curriculum. Cognitive advantages of continuous assessment like distributed practice (Dunlosky et al., 2013) or time for reflection (Moon, 1999), could be cancelled out by the fact that all courses have distributed educational meetings. Students may have prepared for meetings irrespective whether they had continuous assessments or not, independently distributing their practice throughout the semester.

With respect to the second research question, we see results for four student characteristics. Surprisingly, the seven other characteristics in the research did not relate to student achievement. Based on the results we can paint the following picture.

First of all, students with a higher high-school GPA score higher on courses with all different assessment types. High-school GPA is one of the stronger correlates of university achievement (Richardson et al., 2012), and this article presents more evidence for this case.

The second characteristic that plays a role in continuous assessment is gender. On average male students get lower grades than their female peers. However, in the present study, this difference was only significant in the case of courses that use no continuous assessment. This result is interesting in the light of previous research (Richardson et al., 2012) that suggests that the achievement of male students lags behind. The fact that one gender outperforms the other is often called the gender achievement gap. Several studies found that female students perform better than their male counterparts, not just in higher education, but across all educational levels (Machin & McNally, 2005; Richardson et al., 2012). However, depending on the discipline, the gender achievement gap may be reversed (Miyake et al., 2010). A gender achievement gap is generally unwanted, and several measures to bridge this gap are researched. Miyake et al. (2010), for example, used a values affirmation intervention to improve female performance. Our results show that introducing continuous assessment into the curriculum may be a potent intervention in supporting male students. However, when introducing continuous assessment to bridge the gender achievement gap, gender differences in assessment achievement should be considered. As mentioned before, Torres-Guijarro and Bengoechea (2017) found that female students do not score as well on peer and self-assessments as their male peers. So it seems that some types of continuous assessment only benefit men and not women, and probably vice versa. Supporting male achievement by introducing continuous assessment should not be simultaneously detrimental to female achievement.

For the third characteristic, the results indicate that students with a higher level of intrinsic goal orientation get lower scores on courses using writing assignments as continuous assessment. This contrasts with the results of Richardson et al. (2012), who found that intrinsic goal orientation is a positive correlate of achievement.

The fourth, and final, characteristic is task value, which exhibits a negative relationship to student achievement for courses that use homework assignments. Again, this result is the opposite of the results suggested by Richardson et al. (2012).

Both intrinsic goal orientation and task value are aspects of student motivation. Intrinsic goal orientation is comparable to learning goal, or mastery, orientation and task value to academic intrinsic motivation, and both measures are small correlates of academic achievement (Richardson et al., 2012). However, there are also several studies that identified different relationships. Neroni, Meijs, Leontjevas, Kirschner, and De Groot (2017) for example, discovered that mastery approach goals were no significant predictor of student success, measured as achievement, for the distant education students in their sample. One possible explanation they give for this lack of a relationship is that distant education students with a mastery orientation possibly are not driven by grades at all, and only enrol in the courses for their own interest, subsequently not participating in the final exams. Additionally, Baker (2004) also did not find an influence of any motivational construct on student achievement. Her hypothesis for this lack of an effect is that motivation may have influenced achievement indirectly, via perceived stress and adjustment.

A major difference between the two aforementioned studies and our results is that where those found an absence of a relationship between motivation and achievement, our study actually found a significant negative association for motivation on two types of continuous assessment. One explanation for this is that the first year is a foundation year. In this foundation year, students are presented with courses that introduce them to the different facets of their major, which may not all hold their interest. Since the questionnaire is formulated on a course program level, this difference in interest for specific disciplines could have influenced the way students answered the questions. For example, a student with a large interest in criminal law may have reported high levels of interest in their course program with criminal law courses in mind, but subsequently not achieved very well on the other foundation courses. Additionally, individual course difficulty levels also may have influenced student achievement.

The fact that motivation is related to lower achievement for only two out of four assessment-type composite scores complicates the situation even further. It is notable that this relationship does not occur in the courses using a partial exam.

According to Macfarlane (2015), the current higher education climate makes several demands of students. They are expected to attend obligatory class meetings, and to complete assessments during these meetings, a process he calls *presenteeism*. Furthermore, students need to show active participation in the meetings and assessments, which Macfarlane deems *learnerism*. Macfarlane posits that these two processes negate student autonomy to shape their own educational process. Under self-determination theory, a lack of autonomy leads to lower motivation and results (Deci & Ryan, 2000), which can explain the negative impact of motivation in the current study. That is to say, students who report high levels of motivation in the current study may have been demotivated by the lack of autonomy their courses offer. The results of Ibabe and Jauregizar (2010) where motivated students chose to use the self-assessment tool more often also links in to this case of autonomy.

Another explanation for the negative relationship of motivation for writing and homework assignments may be due to a perceived lack of alignment. Results from our previous study (Day et al., 2017) indicate that students prefer continuous assessments that clearly

relate to the final exam. It can be argued that this is especially the case in courses that have a partial exam, and less for the other two types of continuous assessment discussed. In the current study, we cannot comment on this possible lack of alignment, since we did not observe the classes and course materials.

It is striking that the current study did not find support for a relationship between continuous assessment, student characteristics and achievement for six out of eight MSLQ scales. Two of these (self-efficacy and effort regulation) were marked as medium strength correlates by Richardson et al. (2012). The lack of influence of effort regulation may be explained by the design of the curriculum. Peat and Franklin (2002) already mentioned that students used the continuous self-assessments as study guides instead of as assessment tools, and items measuring effort regulation focus on persistence in studying. However, all continuous assessments in the current study were mandatory, and there was no option for students to not persist. In a way, their effort was regulated for them. A possible explanation for the lack of self-efficacy may be that, even though the second semester had already started, students were still unsure of their self-efficacy for their course programs, because of their limited experience with studying in these programs.

Limitations and directions for future research

The main limitation of the current study is the low response rate of almost 35%. The authors suspect that this is partly explained by the fact that the questionnaire was presented as the first step in planned additional research. This additional research requested a more prolonged time investment of students, which may have deterred participation. Low response rates usually lead to biased samples, but when inspecting the average final exam results, the sample does not seem to consist of exceptionally high or low scoring students. The current study could be repeated without the additional requirements, hopefully boosting participation rates.

Furthermore, our study only focused on a subset of the student characteristics investigated in the meta-analysis of Richardson et al. (2012). To expand our results, the relationship between continuous assessment types and other student characteristics like socio-economic status or personality traits should be studied.

As an expansion of our definition of student success focusing on academic achievement, future research could also investigate how continuous assessment and student characteristics relate to other student success outcomes like employability, or perceived competence.

Future research also should take a more extended view into courses by not only examining student achievements, but also looking at course materials in depth. Furthermore, qualitative data in the form of teacher and student observations or interview could be included.

Another direction for future research should focus on motivational development during foundation years, and how continuous assessments relate to this development. This research should also extend to other disciplines, to investigate whether the current outcomes hold true for students studying science and humanities as well.

Concluding remarks

The results of the current article indicate the following:

(1) Continuous assessment supports student success of male students more than that of female students.
(2) There does not seem to be a particular type of assessment responsible for this gender difference.
(3) Writing assignments and mandatory homework assignments may be detrimental to students' motivation.

We believe that teachers who want to improve student achievement by introducing continuous assessment can benefit by carefully aligning the continuous assessment with the final examination of the course. Additionally, perceived usefulness of the continuous assessment is of importance to keep 'students motivated' as well. When these points are taken into account, continuous assessment can be a potent measure to improve student achievement.

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