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Student's experiences with assessment: Differences in course satisfaction and perceived retention for
summative and formative assessment

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Abstract

The present study non-experimentally investigated the relationship between the implementation of formative assessment techniques and Bachelor psychology students' wellbeing, self-efficacy, engagement, study approaches, procrastination behaviour and cheating, with a focus on student satisfaction and perceived retention of course material. Participants (N = 211) were asked to fill out a questionnaire about their experiences with formative and summative assessment, which measured effects on the described dimensions. Positive effects were found for all measured dimensions. Students on average reported significantly higher levels of satisfaction and perceived retention of course material when they thought about experiences with formative assessment. Given the recent spur of implementation of formative techniques by educators due to the pandemic, more research across cultures and university departments is needed to understand the impact of formative assessment on students' experiences.

Keywords: student satisfaction, perceived memory retention, wellbeing, engagement, self-efficacy, study approaches, procrastination behaviour, cheating, formative assessment, summative assessment, student experience

Student's experiences with assessment: Differences in course satisfaction and perceived retention for summative and formative assessment

During the ongoing COVID-19 Pandemic, teaching at universities all over the world underwent drastic changes. The most apparent, which was necessitated by government orders to prevent large gatherings, is the remote nature of studying. This of course not only affected lectures and seminar meetings in higher education but especially assessment. The conventional form of assessment mostly consisted of summative techniques such as applying objectively scored exams and uniform approaches to reach pre-specified learning goals that are the same for all students in a course (Oosterhof et al., 2008). But, because students were permitted to complete exams remotely, the possibilities of deceiving by for example using internet search engines or working in collaboration with course-members, increased with these types of exams (Kennedy et al., 2000). To reduce the rate of deception and to accommodate the remote nature of assessment, a common response by educators to the aforementioned change was the transition to using more formative assessment techniques. This assessment style is characterized by recurring assessment procedures during the learning process and qualitative feedback that gives students opportunities to further develop and improve their work (Huyta, 2010). Because of the individual nature of this technique, it is much harder to deceive the educator. It however also resulted in a very different student experience not only regarding assessment but also changed the general style of teaching in courses (Dendir et al., 2020). With formative assessment techniques, evaluators and teachers can gain a finer-grained understanding of the progress of individual students, which benefits them in different ways. Research for example demonstrated, that students reported larger mean gains in grades when teachers employed individualized progress assessments. It also showed the consistent positive effects that feedback had on learning (Black & William, 1998). Additionally, Leenknecht et al. (2021) found that the application of formative assessment positively influenced students' satisfaction and motivation. Consistent with these findings, feedback has been found to correlate with student satisfaction (Denson et al., 2010). To summarize, even with the recent spur of implementation of formative techniques, research on the impact of formative assessment on the students' experiences is still sparse. The described findings however give

reason to further investigate the relationships between student satisfaction and formative assessment techniques, compared to classical summative assessment.

DeShields, Kara & Kaynak (2005), utilized Herzberg's two-factor model to conceptualize and measure students' satisfaction and identify important predictors. They categorized them as hygiene factors (dissatisfiers) that need to be fulfilled to prevent dissatisfaction and motivating factors (satisfiers) that elicit satisfaction when fulfilled. Based on this conceptualization, Gibson (2010) conducted a meta-analysis to identify specific dissatisfiers and satisfiers that determine student satisfaction. He reported that all examined studies found that the quality of academic-staff and teaching were significant dimensions in predicting student satisfaction. The factors encompass the quality of instruction, the helpfulness of teachers and the quality and quantity of provided feedback. The latter is directly related to the most significant characteristic of formative assessment and gives further reason to assume that there may be a relationship between student satisfaction and formative assessment techniques.

Other variables that had been hypothesized to influence students' satisfaction including the degree of workload and what the students' reasons for enrolling in the course were, only accounted for around 3% in the variance of overall satisfaction and are therefore trivial (Denson et al., 2010). Specific dissatisfiers were unavailable support staff and a lack of social integration, while the most important satisfiers included the degree of student-centeredness and the quality of learning outcomes. Learning outcomes included developed skills, intellectual growth and learned facts (Gibson, 2010). This is not only a dimension that contributes to student satisfaction, as confirmed by Valada et al. (2017) but also an interesting measure by itself for universities to assess the differences in the effectiveness of formative and summative programs. Sometimes it is not viable to assess learning outcomes by employing direct memory tests. In the research presented here, participants were instructed to think of unspecified experiences with summative and formative courses, which means that there was no possibility of linking specific grades and tests to their experiences. For this reason, learning outcomes were summarized in the subjective measure 'perceived retention of course material'. To understand the conceptualization, it is useful to have a closer look at the processes involved in memory formation.

According to the multicomponent model of working memory facts and concepts need to be rehearsed to enter long-term memory (Baddeley & Hitch, 1997; Baddeley, 2000). This can happen via ‘maintenance rehearsal’, which involves superficial repetition of facts, while relational or elaborative rehearsal involves thinking about the topic and actively integrating it into existing knowledge (Reisberg, 2019). Craik and Watkins (1973) found elaborative rehearsal to be far superior to maintenance rehearsal for establishing memory. Additionally, research by Simpson et al. (1994) suggests that students that utilized elaborative rehearsal techniques outperformed students using maintenance rehearsal in every measured dimension, including memory of simple facts and higher-level abstractions. Craik and Lockhart (1972) attributed this effect to differing degrees of depth of processing during the learning process, which is influenced by familiarity of the content and speed of processing (fast for superficial-, slow for deep-learning). Because formative techniques include multiple feedback loops and are therefore offering repeated chances for cognitive engagement and increases in familiarity, it is expected that formative assessment and learning correspond to higher levels of retention of course materials via influencing levels of depth of processing and fostering repeated exposure.

Research question and hypotheses

The purpose of the research presented here, is to gain an understanding of the changes in students’ experiences with assessment, following the increase in usage of formative assessment techniques. The main goal is to explore the relationship between formative assessment techniques and the students’ satisfaction and perceived retention of course material.

H1: It is predicted, that there are differences in population means for satisfaction ratings between experiencing summative and formative assessment

H01: Means of paired differences for satisfaction between formative and summative assessment will be equal (H01: $\mu_1 = \mu_2$).

HA1: Means of paired differences for satisfaction between formative and summative assessment will not be equal (HA1: $\mu_1 \neq \mu_2$).

H2: It is predicted, that there are differences in population means for perceived retention ratings between experiencing summative and formative assessment

H02: Means of paired differences for retention between formative and summative assessment will be equal (H02: $\mu_1 = \mu_2$).

HA2: Means of paired differences for retention between formative and summative assessment will not be equal (HA2: $\mu_1 \neq \mu_2$).

Method

Participants

All participants were recruited from the University of Groningen's Bachelor of Psychology program. Of the 211 participants, 85 (40.3%) were Dutch, 73 (34.6%) were German and 53 (25.1%) were indicating a different country of origin. Most of the participants identified as female ($n=162$, 76.8%), while 47 (22.3%) identified as male. One participant indicated "Other" as gender and one participant did not want to share the gender identity. The mean age of the participants was 20.54 with a standard deviation of 2.204. This was not surprising, since most of our participants (143, 67.8%) started their program in 2021 and were recruited via the University SONA program that mostly targets first-year students. Additionally, 8 students (3.8%) started their university program in 2020, 27 (12.8%) in 2019, 26 (12.3%) in 2018 and 5 (2.4%) in 2017. One participant indicated starting in 2015 and another one started their Minor in 2021. Participation in the study was voluntary. The students received no compensation, monetary or otherwise.

Materials

Participants were provided with a short digital introduction form that stated the goal of the research and provided an estimate of the time that it would take to finish the questionnaires. Additionally, an extensive form that informed participants about the researchers' names and contact information, ethics approval, the aims of the research and the consequences of participating was provided. It also stated how data is procured, treated, and anonymized.

The assessment was conducted using Qualtrics, an online survey tool, which participants could access via a mobile phone, laptop, tablet or desktop-pc. For this research, questionnaires were used to first assess participants' demographic information regarding age, gender, nationality and to get data on the year in which they started their psychology bachelor program. It also assessed whether the program is their first experience in a university or higher education.

General Questionnaire. In contrast to the parts of the questionnaire that specifically enquire about formative and summative assessment, students were first asked to fill out questionnaires on study habits and procrastination, independent of the assessment method. All items were presented in the form of statements and rated on a five-point Likert-type scale with answer options ranging from one (*strongly disagree*) to five (*strongly agree*). The full questionnaire, including all sections and forms, can be found in Appendix A.

The questionnaire on general study habits consisted of six self-constructed items. Study habits describe students' behaviour in relation to learning, which includes learning techniques, time management, learning environment and the frequency of learning. The last three items were constructed to enquire about previous study experiences with higher education and assessment and to gain insights into changes in study habits. The fifth question for example read: "I use the same study habits I have used in high school".

General procrastination habits were first assessed independently of the assessment method too. The questions were adapted from the Procrastination Assessment Scale - Students (PASS; Solomon & Rothblum, 1984). The original questionnaire contains 44 items and has high reliability ($\alpha = .80$). Students were first asked three questions on the extent to which procrastination is a problem for them, with the last item stating: "I want to decrease my tendency to procrastinate on university activities". After that, they were asked to reflect on reasons for their procrastination on nine different items that included statements like "I tend to have too many other things to do", and "I tend to feel overwhelmed by the task".

Questions on summative and formative assessment. The following section of the questionnaire consisted of two parts that were each assessing students' learning approaches, perceived

retention, well-being, satisfaction, self-efficacy, engagement, procrastination and cheating behaviours for formative and summative assessment respectively. Students were randomly assigned to the part that they were asked to fill out first. All of the following items, except for the section about cheating, were presented in the form of statements and rated on a five-point Likert-type scale with answer options ranging from one (*strongly disagree*) to five (*strongly agree*).

Auxiliary measures: self-efficacy. The five items on self-efficacy were adapted from a subscale of the “Motivated Strategies for Learning Questionnaire” by Pintrich (1991). Answers to these items indicated the student’s confidence and perceived capacity to be successful in the program. Two items were stated in a reversed manner, inquiring about the student’s expectation of problems. These include the second item (“I expect to have problems with understanding the most difficult material presented in the readings”) and the fourth item that states: “I expect to have problems with understanding the most difficult material presented by the instructors”. Scoring high on these items indicated low self-efficacy while scoring high on the remaining three items indicated high self-efficacy.

Auxiliary measures: engagement. Items on engagement were partially self-developed and partially taken from a questionnaire measuring experiences of first-year university students in Australia (Krause & Coates, 2008; Schaufeli et al, 2002). The six items assess student’s engagement in participating in the respective type of courses by for example enquiring about a student’s enthusiasm in general (“I am enthusiastic about it.”), as well as about specific matters like lecture attendance (“I attend lectures or watch the recordings”).

Auxiliary measures: study approaches. Items on study approaches specific to formative and summative assessment were partially adapted from the Approaches and Study Skills Inventory for Students (*ASSIST*). The original instrument contains 52 items and has a moderate ($\alpha = .65$) to high reliability ($\alpha = .82$), depending on the study approach (Entwistle et al., 1997). As the general questions on study approaches, the items assessed constructs like learning techniques, time management, learning environment and the frequency of learning. In contrast to the general questions on study habits, however, these ten items were focused on the nature of the learning process with item two, for example stating: “While reading course literature, I try to find out exactly what the author means”,

while item five reads “I concentrate on just memorising a good deal of what I have to learn.” Other items focused on the integration of knowledge (item four: “Much of what I am studying makes little sense: it is like unrelated bits and pieces”) and the students desire for change (item eight: “I wish I could study differently for this type of course.”).

Auxiliary measures: procrastination. Procrastination behaviour specific to formative and summative assessment was assessed by utilizing the same three items from the Procrastination Assessment Scale - Students (PASS; Solomon & Rothblum, 1984) that also appeared in the general procrastination questionnaire. The text however was altered in both conditions to fit the respective type of assessment. The text of question one in the summative section for example read: “I often procrastinate while preparing for exams”. The same question in the formative section stated: “I often procrastinate on these activities”, where activities included mandatory assignments, quizzes or exercises throughout the block, as specified in the question text.

Auxiliary measures: wellbeing. Students’ wellbeing was assessed by utilizing seven self-constructed items that included constructs like workload, perceived stress and general anxiety, which were found to have a significant impact on wellbeing in relation to assessment type (Struyven et al., 2005). Item one for example inquired about the amount of workload (“The overall workload is too much”), while item three stated: “At times I struggle to keep up with these courses”. The sixth item asked about general anxiety about the examination (“I feel anxious before an exam”). Item seven was exclusively added to the formative section of the questionnaire to get insights on the helpfulness of assignments (“The mandatory assignments help me understand the course content”).

Auxiliary measures: cheating. To ensure full anonymity for the part of the questionnaire that assesses cheating behaviour, participants were asked to repeatedly visit a website for a random coin toss and answer each of the following questions according to its outcome. When getting “heads”, students were instructed to tell the truth. Conversely, when “tails” came up, students were supposed to just answer with “yes”. While maintaining the confidentiality of participants, this method allows the researcher to calculate the proportion of truthful responses after receiving the results. This method of randomized response is often used in questionnaires that assess sensitive matters and is based on the work of Warner (1965). The question that the students had to answer according to the randomized

response was based on the Academic Dishonesty Scale by Bashir and Bala (2018). In the summative section of the questionnaire, the question asked the students to indicate if they had cheated in an exam, either by using forbidden materials like calculators, trying to copy someone else's work, or collaborating with others. Answer possibilities were "Yes" and "No". The same question in relation to an assignment was posed in the retention section of the questionnaire, with the addition of a question that asked about cheating behaviour in exams, with the answer possibilities stating "Yes", "No" and "Not applicable".

Main Measures: Satisfaction. The part of the questionnaire that enquired about student satisfaction included nine items. Seven of them were adapted from the "Students Evaluation of Educational Quality" – Questionnaire (SEEQ), which is a widely used instrument that universities employ to assess different factors that were found to have a significant impact on student satisfaction (Coffey & Gibbs, 2001). Namely, these include learning/value, enthusiasm, organization, group interaction, individual rapport, breadth of coverage, examinations /grading, assignments and workload/difficulty (Marsh, 1982). The first seven items were adapted from a shortened version of the questionnaire, as it is currently used by Australian universities (Denson et al., 2010). They were formulated in a way that was easy to read and understand and that covered the major factors which have an impact on student satisfaction. Two items were specifically added for this research, which included item eight, stating: "Approaching deadlines are well communicated", and item nine that reads: "I enjoy the structure of courses with this assessment type". Both of these items were meant to capture differences in satisfaction specifically due to the difference in course structure between formative and summative assessment.

Main Measures: Perceived Retention. Memory or retention is usually assessed via directly testing learned facts and comparing them with the correct or expected answers. Since, in our questionnaire, students were instructed to think of multiple courses of one type, this was not a viable option. Therefore, four items were developed by the researchers to assess the perceived retention of course material. These items were based on research on modes of learning that determine the depth of processing and the degree of integration of knowledge (Simpson et al, 1994). The first and second items incorporated principles of maintenance rehearsal to varying degrees. Item one stated: "I tend to

remember the general topic and learning goals in this type of course”, while item two read: “I tend to remember most of the central concepts and theories that were explained and applied in this type of course”. The third item assessed the degree of elaborative rehearsal (“I could explain the central theories and concepts that were taught in this type of course to a friend”). The fourth item (“I generally expect a high grade in this type of course”) not only enquired about the student’s confidence but also measured the degree to which expectations of a grade may have influenced the given answers.

Design and Procedure

The research design of this study was non-experimental and studied the relationship of students’ experiences with assessment. The dependent variables included perceived retention of course material and students’ satisfaction with the course, comparing differences in scores for summative and formative assessment.

Participants have been recruited by voluntary response either by personal direct messaging via WhatsApp groups through the researchers or via the University of Groningen SONA system, which offered incentives in the form of credits to students.

During recruitment, participants have been provided with a link that they could use to access a website, on which the questionnaire took place. Participants have been able to conduct the study from home or any other place with an internet connection using the online tool (Qualtrics). They have been first presented with a short introduction that stated the studies purpose and an extensive study-information form which gave information on risks and benefits, the voluntary nature of the research and provided the contact details of the research team. Participants have then been asked to give informed consent by reading the consent form (see Appendix A) and then continuing with the study. In case of not consenting, participants have been instructed to exit the online tool. After that, students have been asked to fill out surveys on demographic information and general questions on well-being, study habits and procrastination behaviours.

Participants have then been relayed to the second part of the questionnaire, which started by explaining that students should think of a specific scenario from their study experience while answering the following questions. One of the scenarios has been aimed at courses using formative

assessment techniques (various assignments and feedback that were required during the course) and the other scenario has been aimed at the experience during courses that utilized summative assessment techniques (grade is only determined by a final exam). Participants have had to think of both scenarios and answer both sets of similar questions consecutively but were randomly assigned to the order in which the scenarios appeared. In this part of the questionnaire, students have had to give information on self-efficacy, engagement, study approaches, procrastination behaviour, perceived retention, satisfaction, wellbeing and cheating behaviour. The latter set of questions has utilized a coin-flip method and has asked students to visit a website for a coin-flip to elicit a randomized response.

After the questionnaires had been completed, participants were presented with a message that expressed appreciation for their participation and was followed up by an item that asked them to what degree the information they provided was truthful. They have also been given the opportunity to leave remarks and feedback and were provided with the email address of the head-researcher for the possibility to enquire about the results of the study. Finally, participants who took part in the research via SONA had been relayed to the SONA systems webpage and granted 0.5 SONA credits for the completion of the questionnaire, others could just exit the online tool.

Results

Participant flow

Of the 259 participants that were initially recruited, 45 (16%) students did not complete the survey and were therefore excluded, as well as 3 (1%) students who admitted to not answering truthfully at the end of the survey.

Auxiliary Measures

For each of the following scales, except for the items on cheating, responses on the five-point Likert scales were transformed from a text format to numbers ranging from one (*strongly disagree*) to five (*strongly agree*). Some of the subscales contained reverse-coded items, so the respective numbers were inverted. Since all of our measures were taken within-subjects, the group sizes will not vary ($N=211$).

Auxiliary measures: self-efficacy. For the subscale measuring self-efficacy, high values indicated a high degree of self-efficacy. A small difference in means between summative ($M= 3.32$, $SD = 0.71$) and formative courses ($M= 3.64$, $SD= 0.57$) was found, indicating that on average, students feel more self-efficacious when experiencing formative assessment. Reliability, as indicated by Cronbach's alpha, was high ($\alpha= .80$) for summative and moderate ($\alpha= .68$) for formative courses.

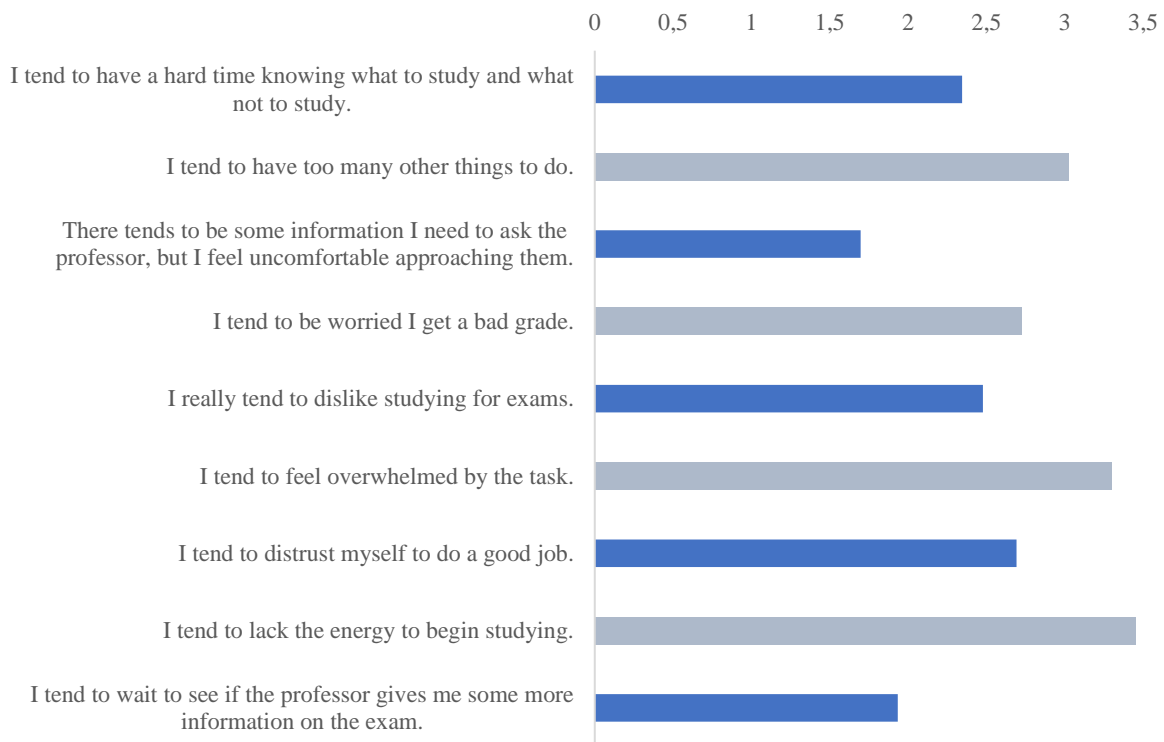
Auxiliary measures: engagement. Scoring high on the measure for student engagement indicated a higher degree of engagement with the course. The mean engagement score for summative courses ($M= 2.96$, $SD= 0.60$) was found to be a little bit lower than the mean engagement score for formative courses ($M= 3.16$, $SD= 0.57$), indicating that on average, students feel slightly more engaged when thinking of formative assessment. The scale is moderately reliable for summative ($\alpha= .56$) and formative ($\alpha= .48$) courses.

Auxiliary measures: study approaches. For the subscale measuring study approaches, a value of one indicated that the subject was employing surface learning, while a value of five indicated the use of deep-learning approaches. Means were only slightly different for summative ($M= 3.28$, $SD= 0.45$) and formative ($M= 3.37$, $SD= 0.40$) assessment methods, indicating that students may employ deep-learning approaches more regularly while experiencing formative assessment. The original scale was moderately reliable ($\alpha= .54$).

Auxiliary measures: procrastination. For measuring procrastination behaviour, a high value indicated that the student had problems with procrastination, while a low value suggested that it was not a problem for the participant. Means were highest for the measures when participants were not instructed to think of a specific assessment method ($M= 3.99$, $SD= 0.83$). However, means were slightly lower for formative courses ($M= 3.67$, $SD= 1$) than for summative courses ($M= 3.85$, $SD= 1.02$), indicating that students were on average procrastinating less when participating in formative assessment. Reliability was generally high for the non-specific questionnaire ($\alpha= .82$), the summative section ($\alpha= .89$) and the formative section ($\alpha= .84$). General reasons for procrastination were recorded independent of assessment types. Means for scores on the nine items can be inspected in Graph 1.

Graph 1

Answer frequencies for items regarding reasons for procrastination across all assessment types



It seems that reasons for procrastination that were rated as the most frequent include item eight which stated “I tend to lack the energy to begin studying”, as well as item four (“I tend to feel overwhelmed by the task”).

Auxiliary measures: wellbeing. For wellbeing, a value of one on the subscale indicated low levels of stress, while a value of five indicated high-stress levels. The mean stress rating for summative courses ($M= 3.70$, $SD= 0.63$) was slightly higher than the one for formative courses ($M=3.36$, $SD= 0.58$), indicating that students were more stressed during summative assessment. Internal reliability, as indicated by Cronbach's alpha was $\alpha= .69$ for summative and $\alpha= .65$ for formative assessment.

Auxiliary measures: cheating. To maintain confidentiality while assessing cheating, participants were asked to give a response that had been randomized by a coin-flip. Participants getting “heads” were asked to report the true answer to the following question(s), while participants who scored “tails” were asked to answer “Yes” regardless of the truth. After receiving the data, responses stating “No” were multiplied by two and then compared to the total number of responses. The resulting percentage (89.1%) was then subtracted from the overall percentages of answers (100%).

The same procedure was applied to results from the formative section. After accounting for answers that were assumed to be non-truthful, it was found that 10.9% of students admitted to cheating in summative assessment, while 6.2% admitted to cheating in assignments during formative assessment.

Main Measures

Main measures: Perceived retention. Retention of course material was operationalized by using four self-generated items that ask about the perceived retention of general concepts and facts. High scores on those items indicated good retention of course material. Internal reliability of the scales was measured by using Cronbach's alpha. For the scale measuring summative courses, the reliability was moderate ($\alpha = .69$), while it was lower for the scale measuring formative courses ($\alpha = .59$). The fourth item asked about general expectations on grades in this kind of course. If the fourth item would have been dropped, Cronbach's alpha would have increased to $\alpha = .72$ for summative and to $\alpha = .64$ for formative assessment. Means for formative assessment showed positive differences in the measure of retention, compared to summative results (Table 1).

Main measures: Satisfaction. Students' satisfaction with the course was measured by using nine items that were partially adapted from the 'Students Evaluation of Educational Quality Questionnaire'. Scoring high on these items indicates high satisfaction with the type of course. The adapted version of the scale used in the present study was moderately reliable for summative assessment ($\alpha = .788$) and formative assessment ($\alpha = .774$). Dropping items did not result in a significant increase in that measure. There were differences in means for satisfaction, with a positive increase for formative courses, compared to summative assessment (Table 1).

Table 1

Means and standard-deviations for satisfaction and retention across assessment style

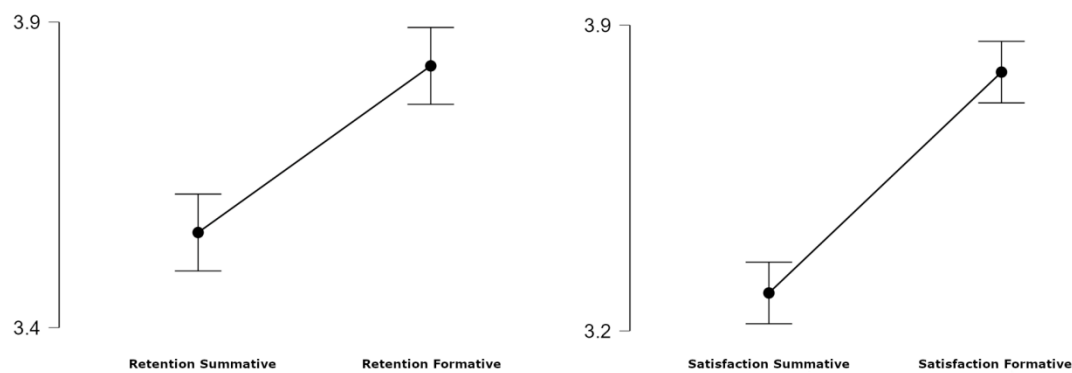
	Satisfaction	Retention
Summative assessment	3.287 (.569)	3.556 (.647)
Formative assessment	3.793 (.507)	3.828 (.483)

Graph 2 displays 95%-Confidence intervals around the means for retention and satisfaction in summative and formative courses. There were visually accessible differences in means as shown by the plots, which indicates a positive change in retention and satisfaction for formative courses.

Graph 2

Descriptive plot featuring 95%-Confidence intervals

95%-Confidence Intervals for Means



Further analysis of the mean differences for the perceived retention items, revealed that all items showed positive differences in means for formative compared to summative assessment. The item with the smallest positive difference was item four, which stated “I generally receive high grades in this type of course” (Table 2, Graph 3).

Table 2

*Descriptive statistics of items on the **retention** scale*

Retention Items	Summative assessment	Formative assessment
“I tend to remember the general topic and learning goals in this type of course”	3.649 (.873)	3.943 (.688)
“I tend to remember most of the central concepts and theories that were explained and applied in this type of course.”	3.739 (.824)	4.000 (.569)
“I could explain the central theories and concepts that were taught in this type of course to a friend.”	3.445 (.916)	3.810 (.732)
“I generally receive a high grade in a course like this.”	3.389 (.976)	3.559 (.867)

Table 3*Descriptive statistics of items on the satisfaction scale*

Satisfaction Items	Summative assessment	Formative assessment
“The aims of this type of course are clear to me.”	3.739 (.841)	4.033 (.612)
“I am given helpful feedback on how I am doing.”	2.147 (.922)	3.389 (1.069)
“This type of course is challenging and interesting.”	3.379 (.888)	3.739 (.783)
“Effective opportunities for active student participation in learning activities are provided.”	2.569 (1.032)	3.668 (.864)
“This type of course is effective for developing my thinking skills.”	3.076 (1.071)	3.858 (.856)
“I was provided with clear information about the assessment requirements for this type of course.”	3.943 (.832)	4.009 (.787)
“The assessment methods and tasks in this type of course are appropriate given the course aims.”	3.403 (1.011)	3.848 (.814)
“Approaching deadlines are well communicated.”	4.147 (.725)	4.052 (.764)
“I enjoy the structure of courses with this assessment type.”	3.180 (1.031)	3.536 (1.011)

Further inspection of the items of the satisfaction scale shows that item eight was the only item with means lower for formative than for summative courses (Table 3). The smallest positive difference in means has been recorded for Item six, which states: “I was provided with clear information about the assessment requirements for this type of course”, and for item eight, which states: “Approaching deadlines are well communicated”.

Graphs 3 and 4 show the answer frequencies of the respective items from the retention and satisfaction subscale, comparing summative and formative assessment. In both graphs, results for formative assessment were slightly shifted to the right of the mean of items in summative assessment. We can also see that on average the proportion of positive responses (*agree, strongly agree*) was consistently higher than the proportion of negative responses (*disagree, strongly disagree*) in the condition, where participants had to think of formative assessment. This indicates a positive shift and suggests that on average (see Table 1) students reported higher satisfaction and retention scores when

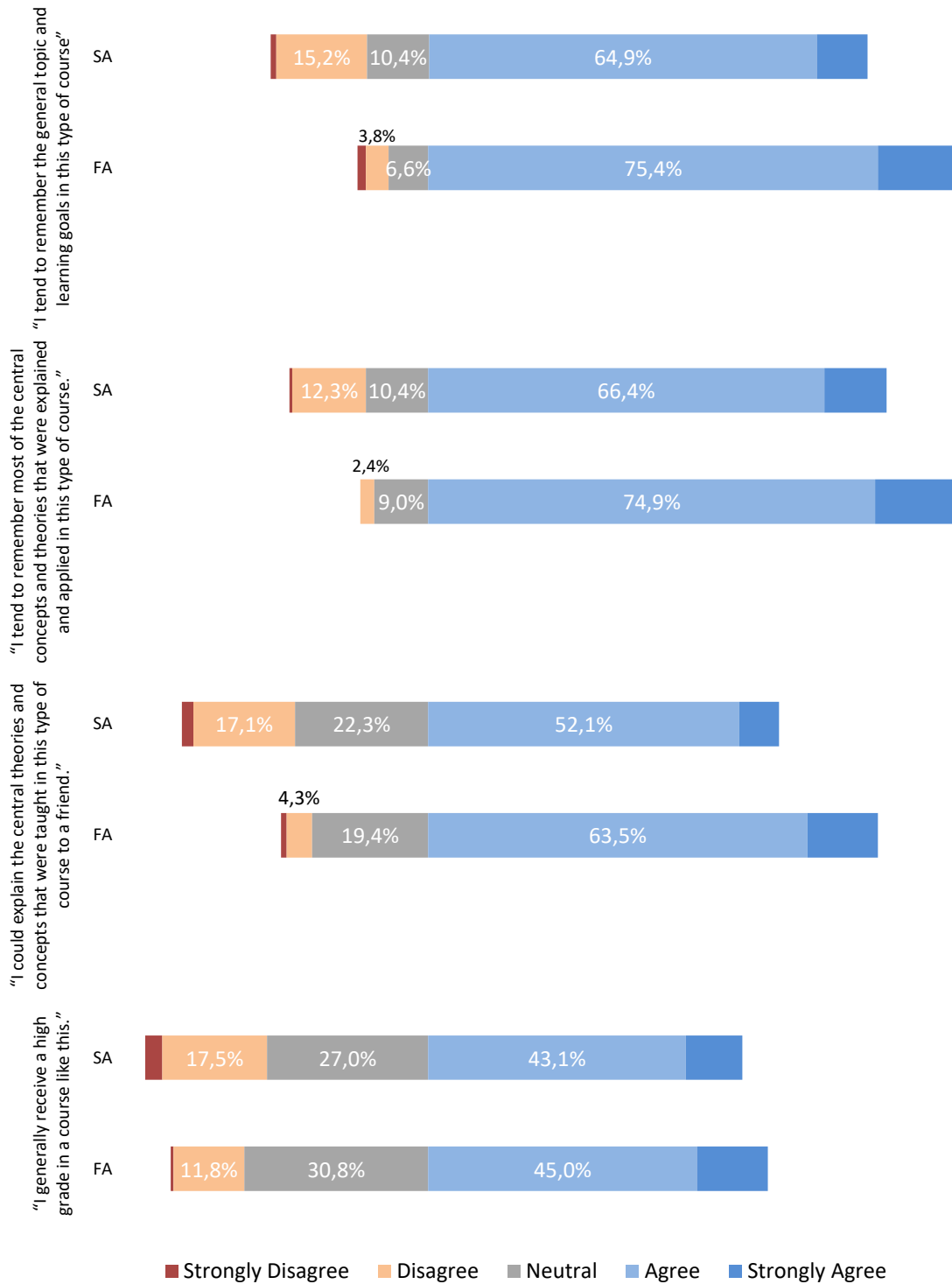
instructed to think about courses that employ formative assessment compared to courses with summative assessment.

Interestingly, it seems that students were especially disappointed with the given feedback in the summative courses, with 73.46% either disagreeing or strongly disagreeing with the statement: “I am given helpful feedback on how I am doing”. Even though it seemed to still be a point of contempt, in the formative courses, the proportion of people either disagreeing or strongly disagreeing with the same statement sank to 25.12%, indicating a major shift. The same dynamic was detected for item four, which states: “Effective opportunities for active student participation in learning activities are provided”. The proportion of participants either disagreeing or strongly disagreeing with the statement was 54% in the summative condition and only 9.5% in the formative condition.

The majority of students also did not seem to strongly enjoy the classical summative structure of courses, with only 39% agreeing or strongly agreeing to the statement “I enjoy the structure of courses with this assessment type”. This proportion increased to 59.72% when students had to think of formative courses. To assess the significance of differences in scores, further analysis was conducted by employing repeated measures ANOVA.

Graph 3

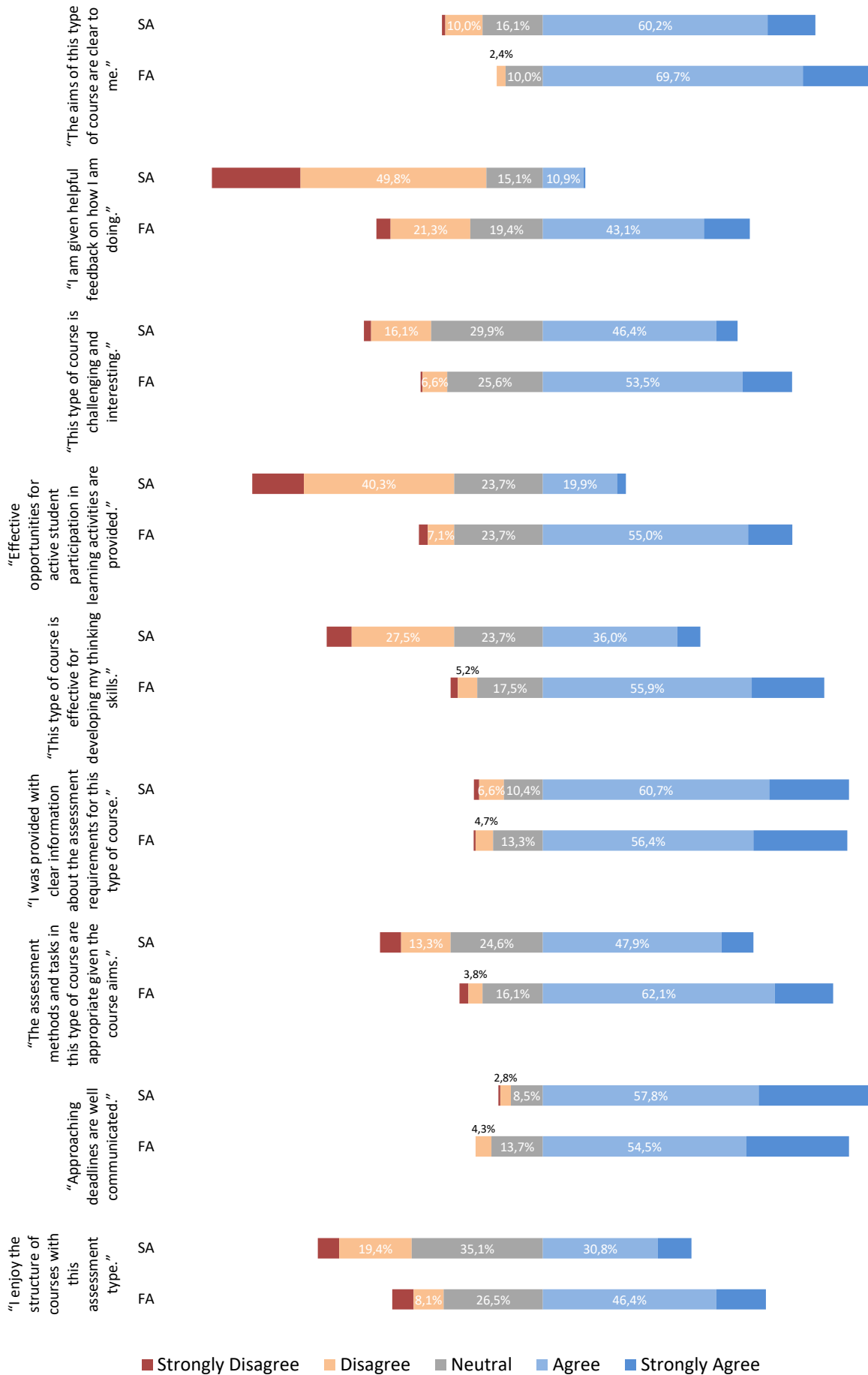
*Answer proportions for items regarding **retention** in summative and formative courses*



Note. The graph compares each item in the summative (SA) formative (FA) conditions.

Graph 4

*Answer proportions for items regarding **satisfaction** in summative and formative courses*



Note. The graph compares each item in the summative (SA) formative (FA) conditions.

Assumption Checks

We assumed independence of participants, as students did fill out the survey independent of each other and had no reason to collaborate. The pairs of measurements were taken from the same subjects respectively. To check the assumption of normality, differences in means have been computed for each of the matched pairs and visualized using QQ-Plots, which did not indicate the need to use a non-parametric test. Outliers were checked but deemed uninfluential due to the sample size.

Inferential Analysis

Because a large group within our sample started their educational program in 2021 (67.8%) and is therefore in their first year of study, a repeated measure ANOVA was carried out to determine if there is a difference in groups between starting years.

A significant main effect for assessment type was found for satisfaction, $F(1,211) = 35.76, p < .001$. For this factor, no significant interaction effect for starting year was found, $F(5,211) = 1.87, p = 0.101$. Additionally, a significant main effect was found for assessment type for perceived retention of course material, $F(1,211) = 21.26, p < .001$. No significant interaction effect for starting year was detected, $F(5,211) = 2.12, p = .064$. Effects were found to be larger for satisfaction ($\eta^2 = .15$) than for retention ($\eta^2 = .09$). Taken together with the descriptive analysis, these results indicate a significant positive difference in means for student satisfaction and perceived retention in courses that employ formative assessment in comparison to summative courses.

Discussion

The purpose of the research presented here was to gain a better understanding of psychology students' experiences with different types of assessment, namely summative and formative assessment. Generally, analysis of descriptive results for the constructs self-efficacy, student engagement, study-approaches, procrastination, wellbeing and cheating behaviour showed positive differences when evaluated in relation to formative assessment.

In line with the first hypothesis, significant differences were found for means of the satisfaction subscale between formative and summative assessment. Inspection of the differences in means and inferential results suggests that students give significantly higher satisfaction ratings when experiencing formative courses compared to summative courses. Additionally, the results of the present study support the second hypothesis in that there are significant differences in students' ratings of retention between summative and formative courses. Results suggest higher retention ratings are associated with formative assessment. The effect sizes of experiencing formative courses on ratings of satisfaction and perceived retention were both large, while the effect on satisfaction ratings was largest. This implies that student satisfaction is affected more by the differences in assessment style than perceived retention.

Because a large proportion of participants indicated that they were in their first year of study, it was expected that measures would be influenced by for example students expectations. Research suggests that students start their higher education with high expectations and that this may lead to dissatisfaction when confronted with reality. They did however only measure satisfaction with one item that inquired about overall satisfaction with the study experience (Braxton et al., 1995). More focused research by Appleton-Knapp and Krentler (2006) found expectations to have a high impact on satisfaction, namely expectations about the course content and teaching quality. It was therefore expected that students' levels of satisfaction would be affected. A test of interaction however did not show any significant interaction effect between the starting year of the program and the differences in scores for satisfaction and retention. Conveniently, the fourth item in the retention scale had been designed to measure expectations of grades for the different types of courses and was the item on that scale that showed the smallest differences between the types of assessment. Viewed together, these results suggest, that differences in satisfaction and retention between assessments are relatively unaffected by the perception of being rewarded with a higher grade or other expectations that specifically first-year students may hold. However, because the reviewed research measured different kinds of expectations, the findings give reason to further investigate the implications.

The reason for assessing satisfaction by universities is often to gain insights on teaching quality and student satisfaction. The insights can then be used to improve educational quality, as

research highlights the importance of incorporating students' feedback in improving academic practices (Solinas et al., 2012). However, Feistauer and Richter (2017) found it to be an unreliable measure for assessing teaching quality and Calma and Dickson-Deane (2020) argue, that this is because the outcome of the university program is only really realized long after leaving university. Elliot and Shin (2002) also argue that satisfaction items mostly measure the subjective student experience and that the outcomes should only be interpreted accordingly. They found satisfaction not only to be influenced by the quality of instruction, but also by factors like the student's subjective ability to get to classes and their access to information. Additionally, findings by Korobova and Starobin (2012) indicate, that the quality of relationships a student engages in, whether professional or personal, was the most important predictor for student satisfaction. In his meta-study, Gibson (2010) also found a lack of social integration to be a specific dissatisfier. For the university, this implicates that satisfaction surveys are useful to gain insights into students' experiences, but maybe contaminated by other factors and are therefore unsuitable as a sole basis for making decisions about the content and teaching quality of the course. Further research could however distinguish between environmental factors like the ability to get to classes, internet access, student housing, social ties etc. and the factors that specifically relate to the content and structure of the course. As the former factors are related to resources, and the study was limited to assessing psychology students of the University of Groningen, further research should also explore different cultural populations and educational backgrounds that are not comprised of what is referred to as a 'WEIRD'-sample (Western, Educated, Industrialized, Rich, Democratized). To assess differences in university programs, the research should also be replicated in different university departments, as Cashin (1990) demonstrated that satisfaction is consistently rated higher in 'Arts and Humanities' subjects, compared to physical sciences, engineering and business subjects.

As research by Denson et al. (2010) demonstrated, frequency and quality of the feedback are the most important predictors of satisfaction. By looking at results from the items on the satisfaction scale those findings seem to hold in the current research: It is clear that the biggest difference in ratings between formative and summative courses is displayed by the answer-frequencies to the statement: "I am given helpful feedback on how I am doing". This implies that the main effect of

formative assessment on satisfaction may be heavily influenced by the frequency and quality of feedback and that universities could take a first step in improving student satisfaction by reviewing their feedback practices.

Because of anonymity, data protection and the way the research was conducted, this study did not review the grades of participants directly, which are usually used to gain an objective measure of retention of facts. Instead, this study employed four self-constructed items that assessed students' perceived retention of course materials, via enquiring about differences in levels of processing. Because of its subjectivity, this measure however may have been influenced by so-called 'Judgements of learning' (JoL). Judgements of learning describe the subjective experience of how much of the course content is remembered. Besides time-passed since the examination, one important factor that influences JoL's is the memory of performance on the last test, irrespective of the subject (Finn & Metcalfe, 2008). Research by Benjamin et al. (1998) corroborates those findings, as they demonstrated that participants were not able to accurately predict their performance on memory tasks, because they did not understand the nature of serial position effects. Because in the study presented here, students had to think of multiple courses of one type (formative or summative) while filling out the respective surveys, and because of the mentioned features of anonymity, it is not clear on basis of which previous test result students made their judgements. Future research could control for this factor by assessing the last test grades of participants. Also, as implied, the study presented here was carried out only among university psychology students, who might be slightly better in, for example, assessing their meta-memory than comparable groups of students in other departments. This could also contaminate the measure of perceived retention and could therefore be further investigated among different departments of the university.

Conclusion

Due to the shift in assessment practices during the pandemic, the students experience while studying changed dramatically. Often, the classical methods of summative assessment were replaced by more formative techniques. The research presented here indicates, that this may have brought about positive changes in the student's self-efficacy, engagement, study approaches, procrastination

behaviour, wellbeing and cheating behaviour. This research specifically focused on the effects of students' satisfaction and perceived retention of course material. Results indicate that formative assessment is associated with positive changes in both measures and that the relative position in the program, as measured by the starting year, did not significantly influence this change. As discussed, it could be argued that the measure of satisfaction is contaminated by factors that are not or just partially under the control of the university. The questions in this research however were designed in a way that specifically inquires about course structure and content and may therefore be largely unaffected by those variables. Additionally, the measure of perceived retention can be used as a starting point to further investigate course outcomes, however, in future research, direct memory tests may be employed to rule out the confounds of 'Judgements of Learning'. This research demonstrated that the change to formative assessment can have positive impacts on student experience across all of the measured dimensions and that students would benefit from the adoption of certain principles of formative assessment to improve perceived retention and students' satisfaction.

References

- Appleton-Knapp, S.L., & Krentler, K.A. (2006). Measuring student expectations and their effects on satisfaction: The importance of managing student expectations. *Journal of Marketing Education*, 28(3), 254–264.
- Baddeley, Alan D.; Hitch, Graham (1974). Gordon H. Bower (ed.). *Working Memory. The psychology of learning and motivation*. 2. Academic Press. doi:10.1016/S0079-7421(08)60452-1. ISBN 978-0-12-543308-2. OCLC 777285348
- Baddeley, A. D. (2000). The episodic buffer: a new component of working memory? *Trends Cogn. Sci.* 4 (11): 417–423.
- Baleni, Z. G. (2015). Online Formative Assessment in Higher Education: Its Pros and Cons. *Electronic Journal of E-Learning*, 13(4), 228–236.
- Bashir, H., & Bala, R. (2018). Development and Validation of Academic Dishonesty Scale (ADS): Presenting a Multidimensional Scale. *International Journal of Instruction*, 11, 57-74.
<https://doi.org/10.12973/iji.2018.1125a>

- Benjamin, A. S., Bjork, R. A., & Schwartz, B. L. (1998). The mismeasure of memory: When retrieval fluency is misleading as a metamnemonic index. *Journal of Experimental Psychology: General*, 127(1), 55–68. <https://doi.org/10.1037/0096-3445.127.1.55>
- Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice*, 5(1), 7–74. <https://doi.org/10.1080/0969595980050102>
- Braxton, J. M., & And Others. (1995). Expectations for College and Student Persistence. *Research in Higher Education*, 36(5), 595–612.
- Calma, A., & Dickson-Deane, C. (2020). The Student as Customer and Quality in Higher Education. *International Journal of Educational Management*, 34(8), 1221–1235.
- Craik, F. I. M., & Lockhart, R. S. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior*, 11(6), 671.
- Craik, F. I. M., & Watkins, M. J. (1973). The role of rehearsal in short-term memory. *Journal of Verbal Learning and Verbal Behavior*, 12, 599–607.
- Dendir, Seife & Maxwell, Stockton. (2020). Cheating in online courses: Evidence from online proctoring. *Computers in Human Behavior Reports*. 2. 100033. [10.1016/j.chbr.2020.100033](https://doi.org/10.1016/j.chbr.2020.100033).
- Denson, N., Loveday, T., & Dalton, H. (2010). Student evaluation of courses: what predicts satisfaction? *Higher Education Research & Development*, 29(4), 339–356.
- DeShields, O. W., Kara, A., & Kaynak, E. (2005). Determinants of business student satisfaction and retention in higher education: applying herzberg's two-factor theory. *International Journal of Educational Management*, 19(2), 128–139. <https://doi.org/10.1108/09513540510582426>
- Elliot, K.M., & Shin, D. (2002). Student satisfaction: An alternative approach to assessing this important concept. *Journal of Higher Education Policy and Management*, 24(2), 197–209.
- Elliott, K. M. (2002). Key determinants of student satisfaction. *Journal of College Student Retention: Research, Theory and Practice*, 4(3), 271–279. <https://doi.org/10.2190/B2V7-R91M-6WXR-KCCR>
- Entwistle, N. J., McCune, V., & Tait, H. (1997). The approaches and study skills inventory for students (ASSIST). Edinburgh: Centre for Research on Learning and Instruction, University of Edinburgh.

- Feistauer, D. and Richter, T. (2017), "How reliable are students' evaluations of teaching quality? A variance components approach", *Assessment and Evaluation in Higher Education*, Vol. 42 No. 8, pp. 1263-1279.
- Finn, B., & Metcalfe, J. (2008). Judgments of Learning Are Influenced by Memory for Past Test. *Journal of Memory and Language*, 58(1), 19–34.
- Gibson, A. (2010). Measuring business student satisfaction: a review and summary of the major predictors. *Journal of Higher Education Policy and Management*, 32(3), 251–259
- Huyta A (2010) Diagnostic and formative assessment. In: Spolsky B and Hult F (eds) *The Handbook of Educational Linguistics*. Oxford: Blackwell, pp. 469–82.
- Johnston, R. (1995). The determinants of service quality: Satisfiers and dissatisfiers. *International Journal of Service Industry Management*, 6(5), 53–71.
- Kennedy, K., Nowak, S., Raghuraman, R., Thomas, J., & Davis, S. F. (2000). Academic dishonesty and distance learning: Student and faculty views. *College Student Journal*, 34(2), 309–314.
- Kerri-Lee Krause & Hamish Coates (2008) Students' engagement in first-year university, *Assessment & Evaluation in Higher Education*, 33:5, 493-505, DOI: 10.1080/02602930701698892
- Korobova, N., & Starobin., S. S. (2012). A comparative study of student engagement, satisfaction, and academic success among international and american students. *Journal of International Students*, 5(1), 72–85, <https://doaj.org/article/decf2c3cba544d5b93159b10e8f428ac>
- Leenknecht, M., Wijnia, L., Köhler, M., Fryer, L., Rikers, R., & Loyens, S. (2021). Formative Assessment as Practice: The Role of Students' Motivation. *Assessment & Evaluation in Higher Education*, 46(2), 236–255.
- Marsh, H. W. (1982). Seeq: a reliable, valid, and useful instrument for collecting students' evaluations of university teaching. *British Journal of Educational Psychology*, 52(1), 77–95.
- Oosterhof, A., Conrad, R. M., & Ely, D. P. (2008). *Assessing learners online*. New Jersey: Pearson.
- Reisberg, D. (2019). *Cognition: exploring the science of the mind* (7e International Student). W. W. Norton & Company.
- Richardson, J. T. E. (2005). Instruments for obtaining student feedback: a review of the literature. *Assessment and Evaluation in Higher Education*, 30(4), 387–416.

- Schaufeli, W.B., Salanova, M., González-romá, V (2002). The Measurement of Engagement and Burnout: A Two Sample Confirmatory Factor Analytic Approach. *Journal of Happiness Studies* **3**, 71–92 (2002). <https://doi.org/10.1023/A:1015630930326>
- Simpson, M. L., Olejnik, S., Yu-Wen Tam, A., & Supattathum, S. (1994). Elaborative verbal rehearsals and college students' cognitive performance. *Journal of Educational Psychology*, *86*(2), 267–267.
- Solinas, G., Masia, M.D., & Muresu, E. (2011). What really affects student satisfaction? An assessment of quality through university-wide student survey. *Creative Education*,*3*(1), 37-40.
- Solomon, L. J., & Rothblum, E. D. (1984). Academic procrastination: frequency and cognitive-behavioral correlates. *Journal of counseling psychology*, *31*(4), 503.
- Struyven, K., Dochy, F., & Janssens, S. (2005). Students' perceptions about evaluation and assessment in higher education: A review. *Assessment & Evaluation in Higher Education*, *30*(4), 325-341.
- Valadas, S. T., Almeida, L. S., & Araújo, A. M. (2017). The mediating effects of approaches to learning on the academic success of first-year college students. *Scandinavian Journal of Educational Research*, *61*(6), 721–734. <https://doi-org.nl/10.1080/00313831.2016.1188146>
- Warner, S. L. (1965). Randomized Response: A Survey Technique for Eliminating Evasive Answer Bias. *Journal of the American Statistical Association*, *60*(309), 63-69.
<https://doi.org/10.1080/01621459.1965.10480775>

Appendix A

Full questionnaire

Student Assessment

“Student experience of University assessment: is the exam still relevant?”

PSY-2122-S-0060

Dear participant, welcome to this study!

In the following, we would like to understand **your** experiences of different assessment types as a student majoring or minoring in Psychology.

Ultimately, we would like to give a **recommendation to the faculty** as to what kind of courses are most beneficial for the students in this programme, which is why **your help matters**.

In order to do this, we kindly ask you to fill out our questionnaire. This will take you about **20 minutes**.

More **detailed information** about the study itself, your participation, and the way we will treat your data will follow on the next page.

INFORMATION ABOUT THE RESEARCH

Version for participants

“STUDENT EXPERIENCE OF UNIVERSITY ASSESSMENT: IS THE EXAM STILL RELEVANT?” PSY-2122-S-0060

Why do I receive this information? You are kindly invited to participate in our current research on student experiences of university assessment. You are in the Bachelor or Minor programme of Psychology and have experienced assessments in this programme. This study started in November 2021 and will continue until January 2022. The study has been evaluated by the Ethics Committee of Psychology (ECP) of the University of Groningen. Principal investigator of the study is Dr. A. Sarampalis, additional researchers are L.M. Duiverman, S.A.A. Fritzsche, O. Konradt, M.K. Kuhnert, J. Wulf, T. Mueller-Scholtz.

Do I have to participate in this research? Participation in the research is voluntary. However, your consent is needed. Therefore, please read this information carefully. Ask all the questions you might have, for example, because you do not understand something. Only afterwards decide if you want to participate. If you decide to not participate, you do not need to explain why, and there will be no negative consequences for you. You have this right at all times, including after you have consented to participate in the research.

Why this research? During the COVID-19 lockdowns, assessment at the university has gone through some changes. There has been more focus on assessments for learning purposes (formative assessment) in addition to assessment for grading purposes (summative assessment). Through this study, we would like to discover how these different types of assessment are experienced by you, the students, in order to make recommendations to the faculty to improve on their assessments.

What do we ask of you during the research? Before beginning with the study please read this information thoroughly. If you decide to participate in this study you will first be asked to provide informed consent. Then you will fill out a few short questionnaires on procrastination, your experiences with assessment for grading, and assessment for feedback.

What are the consequences of participation?

This research might provide the faculty members with new information on how students experience their exams and different types of assessment. In the future, this could help to improve the assessment types used by the faculty. We do not foresee any significant negative effects or discomfort as a consequence of this study.

How will we treat your data? *For SONA participants* Your data will be treated confidentially. Because we ask you for your SONA number, the data collection is not

completely anonymous: your SONA number is linked to your name and email address. However, we do not have access to your name and email address; only the SONA administrator does. Nonetheless, your data will only become anonymous once we delete your SONA number, which we will do at the end of data collection, i.e. 14-12-2021. Until this date, you can ask to have your data removed from the dataset. Afterwards this is no longer possible. *For other participants:* Data collection is designed to be anonymous, in other words, we do not ask you for any information that could be used to identify you as a person. The questionnaire data are collected using online software which uses secure servers. After the study ends all data will be stored anonymously according to the Faculty of Behavioural and Social Sciences data management protocol. *For SONA participants:* You have the right to access, rectify, and erase your data for as long as your data remains linked to your SONA number, i.e. until 14-12-2021. To exercise this right you can send an email to the Principal investigator stating your SONA number and that you wish to have your data removed. Please do so before 14-12-2021.

What else do you need to know? You may always ask questions about the research: now, during the research, and after the end of the research. You can do so by emailing the researchers at l.m.duiverman@student.rug.nl or by emailing (a.sarampalis@rug.nl) or phoning (+31 50 36 36778) the principal investigator. Do you have questions or concerns regarding your rights as a research participant? For this you may also contact the Ethics Committee of Psychology of the University of Groningen: ecp@rug.nl *For SONA participants:* Do you have questions or concerns regarding your privacy, or the handling of your personal data? For this, you may also contact the Data Protection Officer of the University of Groningen: privacy@rug.nl.

As a research participant, you have the right to a copy of this research information.

INFORMED CONSENT (for participants aged 16 years or older)

“Student experience of University assessment: is the exam still relevant?” PSY-2122-S-0060

Please indicate below whether you consent with the following statements:

I have read the information about the research and I have had the opportunity to ask questions about it.

The information provided gave me a sensible idea about ...

... the **content** of the research.

... my **involvement** in the research.

... possible **consequences** of participating.

... how my **data** is handled.

... my **rights**. I understand that my participation is voluntary and I can stop participating at any moment without having to give an explanation. This will have no negative consequences for me.

If you **consent** to participate, please click "→" to go to the questionnaire.

If you **do not consent** to participate, please close this qualtrics window to stop participating. Which gender do you most identify with?

- Female
- Male
- Other
- I would rather not say

What is your age (in years)?

What is your nationality?

- Dutch
- German
- Other (please indicate): _____

Which year did you start your Psychology Bachelor?

- 2021
- 2020
- 2019
- 2018
- 2017
- Other: _____

Is the Psychology Bachelor your first college/university programme?

- Yes
- No (please indicate for how many years you were enrolled in other programmes):

Please reflect on your **study habits in general** since starting higher education.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I feel like my study habits have improved since enrolling in this programme.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other students have helped me to improve my study habits.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The University provided me with information or advice that I found helpful in improving my study habits.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wish I could improve my study habits.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use the same study habits I have used in high school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I just memorize the material instead of trying to understand it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The questions on this page concern your **procrastination behaviour** on university activities **in general**.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I often procrastinate on university activities in general.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Procrastination on university activities is a problem for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I want to decrease my tendency to procrastinate on university activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How much does each of the following reasons reflect **why** you tend to procrastinate?

	Not at all reflects why I procrastinated	Reflects a little	Somewhat reflects	Reflects a lot	Definitely reflects why I procrastinated
I tend to have a hard time knowing what to study and what not to study.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to have too many other things to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There tends to be some information I need to ask the professor, but I feel uncomfortable approaching them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to be worried I get a bad grade .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I really tend to dislike studying for exams.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to feel overwhelmed by the task.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to distrust myself to do a good job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to lack the energy to begin studying.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to wait to see if the professor gives me some more information on the exam .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

We will now ask you to fill out two very similar questionnaires; both are about your experiences with assessment at university.

One of them will be about courses in which your grade is determined only by a **final exam** (which may be in two or more partials) and there are **no other mandatory assignments**.

The other one will be about courses that **include mandatory assignments, quizzes, or exercises** *throughout* the block (possibly in addition to a final exam). The purpose of these may be to help you study or learn the subject better or as a requirement or determinant of the final grade.

You will find some further instruction at the beginning of each block of questions.

The following questions will ask you about your experience with courses in which your grade was determined **only by a final exam** (which may be in two or more partials) and there were **no other mandatory assignments**. Please answer with all the courses of this type in mind, rather than a specific one.

When participating in this **type** of course...

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I am confident that I will pass .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I expect to have problems with understanding the most difficult material presented in the readings .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am confident that I can understand the basic concepts taught.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I expect to have problems with understanding the most difficult material presented by the instructors .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am certain that I can master the skills being taught.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

When participating in this **type** of course...

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I am enthusiastic about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do the bare minimum of work to pass the course (or obtain my desired grade).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I regularly work with classmates on the material.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I usually cram before an exam.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I **attend** lectures or **watch** the recordings.

I **contact lecturers** regarding the material, for example via the discussion forum or via email.

Below are some statements regarding your **retention** of course material. Please rate them in terms of how closely they reflect your experience with this type of course.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I tend to remember the general topic and learning goals in this type of course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to remember most of the central concepts and theories that were explained and applied in this type of course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I could explain the central theories and concepts that were taught in this type of course to a friend .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I generally receive a high grade in a course like this.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The next questions will **still** ask you about your experience with courses in which your grade was determined **only by a final exam** (which may be in two or more partials) and there were **no other mandatory assignments**. Please answer with all the courses of this type in mind, rather than a specific one.

Below are statements concerning your **learning approaches** for this type of course.

Please rate them in terms of how close they are to your own thoughts.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
It is important for me to follow arguments, or to see the reason behind course contents.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
While reading course literature, I try to find out exactly what the author means .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often wonder whether the work I am doing is really worthwhile .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Much of what I am studying makes little sense : it is like unrelated bits and pieces.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I concentrate on just memorising a good deal of what I have to learn.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My study habits are appropriate for this type of assessment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am satisfied with my study habits for this type of course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wish I could study differently for this type of course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I study in order to master the material.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I study regularly .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The next questions concern your **procrastination behaviours** while **preparing for exams** in courses in which your grade is determined only by a final exam.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I often procrastinate while preparing for exams.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Procrastination on preparing for exams is a problem for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I want to decrease my tendency to procrastinate on preparing for exams.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The next questions will **still** ask you about your experience with courses in which your grade was determined **only by a final exam** (which may be in two or more partials) and there were **no other mandatory assignments**. Please answer with all the courses of this type in mind, rather than a specific one.

Below are statements regarding your **satisfaction with this type of course**. Please rate them in terms of how close they are to your own thoughts.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The aims of this type of course are clear to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am given helpful feedback on how I am doing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This type of course is challenging and interesting .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Effective opportunities for active student participation in learning activities are provided.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This type of course is effective for developing my thinking skills .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was provided with clear information about the assessment requirements for this type of course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The assessment methods and tasks in this type of course are appropriate given the course aims.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approaching deadlines are well communicated .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy the structure of courses with this assessment type.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Below are some questions concerning courses with this **assessment type** and how they affected your **wellbeing**. Please rate them in terms of how close they are to your own thoughts.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
The overall workload is too much.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Studying for the exam is stressful .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At times I struggle to keep up with these courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At times I feel like there is nothing to study for.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During the exam period the workload is a lot heavier.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel anxious before the exam.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the next question, a **coin toss method** (please find detailed information down below) is used to ensure that your answers to this question are **fully anonymous**.

Please use [this webpage](#) to flip a coin **before** answering the question and answer the question according to the **outcome** of the coin toss.

If the coin comes up **heads**, then answer the question **truthfully**; if it comes up **tails**, just say 'yes' no matter what you would have answered.

Follow this [link](#) for more information on the coin toss method.

The question concerns your **general cheating behaviour** in exams.

Please indicate whether you have ever done any of the following:

- I used prohibited things like **hidden notes, calculators and other electronic devices**.

- I **tried to copy** answers from another person.
- I **successfully copied** answers from another person.
- **Someone else** completed an exam in my name.
- I **collaborated** with others during an exam.

Yes

No

The following questions will ask you about your experiences with courses that include **mandatory assignments, quizzes, or exercises** throughout the block (possibly in addition to a final exam).

The purpose of these may be to help you study or learn the subject better or as a requirement or determinant of the final grade.

Examples of such assignments are: Slimstampen, statistics homework, holding a presentation, or completing regular quizzes.

Please answer with all the courses of this type in mind, rather than a specific one.

When participating in this **type** of course...

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I am confident that I will pass .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I expect to have problems with understanding the most difficult material presented in the readings .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am confident that I can understand the basic concepts taught.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I expect to have problems with understanding the most difficult material presented by the instructors .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am certain that I can master the skills being taught.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

When participating in this **type** of course...

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I am enthusiastic about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do the bare minimum of work to pass the course (or obtain my desired grade).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I regularly work with classmates on the material.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I usually cram before an exam or deadline.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I attend lectures or watch the recordings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I contact lecturers regarding the material, for example via the discussion forum or via email.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Below are some statements regarding your **retention** of course material. Please rate them in terms of how closely they reflect your experience with this type of course.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I tend to remember the general topic and learning goals in this type of course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to remember most of the central concepts and theories that were explained and applied in this type of course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I could explain the central theories and concepts that were taught in this type of course to a friend .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I generally receive a high grade in a course like this.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The next questions will **still** ask you about your experiences with courses that include **mandatory assignments, quizzes, or exercises** throughout the block (possibly in addition to a final exam). Please answer with all the courses of this type in mind, rather than a specific one.

Below are statements concerning your **learning approaches** for this type of course.

Please rate them in terms of how close they are to your own thoughts.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
It is important for me to follow arguments, or to see the reason behind course contents.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
While reading course literature, I try to find out exactly what the author means .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often wonder whether the work I am doing is really worthwhile .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Much of what I am studying makes little sense : it is like unrelated bits and pieces.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I concentrate on just memorising a good deal of what I have to learn.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The regular assignments help me structure .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My study habits are appropriate for this type of assessment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am satisfied with my study habits for this type of course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wish I could study differently for this type of course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I study in order to master the material.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I study regularly .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The next questions concern your **procrastination behaviours** in courses that include mandatory assignments, quizzes, or exercises throughout the block (possibly in addition to a final exam).

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I often procrastinate on these activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Procrastination on these activities is a problem for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I want to decrease my tendency to procrastinate on these activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The next questions will **still** ask you about your experiences with courses that include **mandatory assignments, quizzes, or exercises** throughout the block (possibly in addition to a final exam). Please answer with all the courses of this type in mind, rather than a specific one.

Below are statements regarding your **satisfaction with this type of course**. Please rate them in terms of how close they are to your own thoughts.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The aims of this type of course are clear to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am given helpful feedback on how I am doing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This type of course is challenging and interesting .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Effective opportunities for active student participation in learning activities are provided.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This type of course is effective for developing my thinking skills .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was provided with clear information about the assessment requirements for this type of course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The assessment methods and tasks in this type of course are appropriate given the course aims.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Approaching deadlines are well communicated .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy the structure of courses with this assessment type.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Below are some questions concerning courses with this **assessment type** and how they affected your **wellbeing**. Please rate them in terms of how close they are to your own thoughts.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The overall workload is too much.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Studying for the exam is stressful .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At times I struggle to keep up with these courses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At times I feel like there is nothing to study for.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During the exam period the workload is a lot heavier.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel anxious before an exam.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The mandatory assignments help me understand the course content.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the next questions, a **coin toss method** (please find detailed information down below) is used to ensure that your answers to this question are **fully anonymous**.

Please use [this webpage](#) to flip a coin **before** answering **each** question and answer the question according to the **outcome** of the coin toss.

If the coin comes up **heads**, then answer the question **truthfully**; if it comes up **tails**, just say 'yes' no matter what you would have answered.

Follow this [link](#) for more information on the coin toss method.

The next question concerns your **general cheating behaviour** in the **assignments**.

Please indicate whether you have ever done any of the following:

- I received **help** for completing an individual assignment.
- I used resources (sentences/lines/words) **without citing the author**.
- I used answers (copying the whole or parts) **from someone** who did the assignment earlier.
- I let **someone else** complete an assignment in my name.

Yes

No

Please use [this webpage](#) again.

The next question concerns your **general cheating behaviour** in the **exams** of courses using additional assignments.

Please indicate whether you have ever done any of the following:

- I used prohibited things like **hidden notes, calculators and other electronic devices**.
- I **tried to copy** answers from another person.
- I **successfully copied** answers from another person.
- **Someone else** completed the exam in my name.
- I **collaborated with others** during an exam.

Yes

No

Not applicable

Press the → button at the end of the page to get your SONA credits and to close the survey correctly.

This is the end of our questionnaire on assessment methods. We highly appreciate that you spent your time answering our questions. Thank you!

We would like to know if you **answered the questions truthfully and followed the instructions on the questions about cheating**. Your response to this question has no negative effects for you, but it would help us ensure that the quality of the data is high.

- I answered truthfully
- I answered mostly truthfully
- I did not answer truthfully

Do you have any additional comments you would like to share with us? Please write those down below.

If you would like information about the results of the study, please contact one of the researchers by emailing a.sarpalis@rug.nl.

Thank you again for your time.

Press now the → button to get your SONA credits and to close the survey correctly.