

Challenge and learning in honours education

A quantitative and qualitative study on students' and teachers' perceptions

Janine Haenen (J. Haenen)¹

Educational advisor and researcher, The Hague University of Applied Sciences, The Netherlands²

Sylvia Vink (C. C. Vink)

Director of Education, Faculty of Social Sciences, Vrije Universiteit Amsterdam, The Netherlands and Researcher ICLON, Leiden University, The Netherlands

Ellen Sjoer (E. Sjoer)

Professor Sustainable Talent Development, The Hague University of Applied Sciences, The Netherlands

Wilfried Admiraal (W. F. Admiraal)

Professor Educational Sciences, ICLON, Leiden University, The Netherlands

¹ Postal address Janine Haenen: Fahrenheitstraat 134, 2561 EG The Hague, The Netherlands, e-mail address: j.haenen@hhs.nl

² Postal address where the work was carried out: The Hague University of Applied Sciences, Johanna Westerdijkplein 75, 2521 EN The Hague, The Netherlands

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In honours programmes teachers face the task to design courses in which students feel challenged and learn from accomplishing demanding assignments. The aim of this study was to investigate students' and teachers' perceptions on challenge and learning in an honours programme. From 2016 to 2019, students and teachers rated the learning activities during the programme and explained their ratings. The results showed that in the first two years, teachers estimated challenge and learning significantly higher than the students did. However, both students and teachers viewed the tasks as the factor with the strongest impact on challenge and learning. In the first year, students also identified group dynamics as challenging and a source for learning. Enhancing task complexity and supporting group dynamics are the main factors to adjust the level of challenge in an honours programme. Monitoring students' and teachers' perceptions can help to adapt the programme to improve students' learning.

Keywords: challenge; learning; honours education; students' perceptions; teachers' perceptions

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Introduction

To foster students' learning in honours programmes, challenge is identified as being the core element. The feeling of being challenged increases the effort of high ability students (Scager et al., 2012). Challenge relates to students' feelings of being able to complete demanding tasks. Accomplishing such tasks stimulates students' intrinsic motivation, which is a fundament for study success (Ryan & Deci, 2000). The effectiveness of honours programmes may depend highly on teachers' skills to manipulate the level of challenge. Globally, honours programmes highly differ due to varying selection criteria (cf. Stoller, 2004 and Wolfensberger, Van Eijl, & Pilot, 2012), diverging degrees (cf. Scager et al., 2012 and Van Ginkel, Van Eijl, Zubizarreta, & Pilot, 2012) and content (cf. Scager et al., 2012 and Van Eijl & Pilot, 2019). However, they all have in common that they are designed to challenge students more than regular programmes regularly do. In the Netherlands, honours education generally comprises challenging extracurricular programmes in bachelor education, either revolving around research projects or transdisciplinary projects in which students work with stakeholders from the professional field (Van Eijl & Pilot, 2019; Wolfensberger, Van Eijl, & Pilot, 2012). If we know more about what exactly constitutes challenge to an honours programme and what factors affect students' learning in such a programme, we may be able to design honours programmes that encourage students to use their full potential.

The relation between challenge and learning

In their self-determination theory, Ryan and Deci (2000) describe the three basic psychological needs that students have in order to feel intrinsically motivated to learn. Apart from the fundamental needs of feeling connected and the experience of autonomy, the need to feel competent is crucial. The feeling of competency refers to the feeling of being successful in a task. Their learning is maximized if students experience a level of challenge that lies slightly above their ability level (Ryan & Deci, 2020). Vermunt and Verloop (1999) label this as constructive friction. This harmonises with Csikszentmihalyi's theory of flow (2000) that describes flow as a state of intrinsic motivation in which people show optimal concentration and focus. Flow is most likely to occur if the level of challenge is just above the ability level.

Challenge and learning in honours education

In an effective learning environment students experience an optimal balance between challenge and ability. Students apply for an honours programme, because they seek more challenge: a challenge that exceeds their ability level or a programme that provides training in skills that are not trained in their regular programme. Scager et al. (2012) stipulate challenge as essential in fostering honours' students learning, but state that this is hardly studied in higher education honours programmes. Which aspects of the learning environment constitutes the feeling of challenge for honours students? Scager et al. (2013) found that a combination of three factors is crucial: autonomy such as providing students choices and non-directive feedback, complexity by providing novel and abstract tasks and teachers' high expectations of students. Challenge in honours education can thus be defined as multi-faceted. Hence, teachers in honours

programmes face the responsibility to design tasks, based on this multi-faceted concept of challenge.

Effective teaching for honours students

The factors autonomy, complexity and teachers' expectations to arouse challenge (Scager et al., 2013) are related to the effective teaching strategies as identified by Wolfensberger (2012): supporting freedom, enhancing academic competence, and creating a community. Supporting freedom is about guiding students in their choices while giving students plenty of freedom to choose and to experiment and develop personal initiatives. This fosters the feeling of autonomy. The second teaching strategy, enhancing academic competence, refers to teachers' capability to provide students with complex tasks that incite them to explore an issue in-depth and with a wide scope. Thirdly, creating an honours community of students and teachers as co-learners is a teaching strategy that fosters a feeling of connectedness (Wolfensberger, 2012).

Designing a challenging programme is also a challenge for the teachers themselves: they should maintain students' safety and keep all students on board while at the same time challenging them to get the best out of themselves. The extent of the challenge depends on the judgement of the teachers as to whether their students are able to handle the tasks (Scager et al., 2017). In addition to the teachers' dependent factors (students' autonomy, complexity of tasks, and teachers' expectations), the support of peer students in a learning community influences the friction between challenge and ability: peer support can help students overcome their feelings of being over-challenged (Scager et al., 2012).

Honours education in The Netherlands

Globally, there is a rich variety in design and organization of honours education. This

also applies to The Netherlands, in which honours programmes can be very diverse (Wolfensberger, Van Eijl, & Pilot, 2012). In the current study, we investigate a Dutch honours programme of a University of Applied Sciences. Honours programmes in this context are undergraduate programmes, which either are whole programmes or can be part of study programmes. Selection is mainly based on the students' motivation to participate, sometimes in combination with their grades. Credits can be obtained as replacement of regular bachelor credits or extracurricular with receiving an additional certificate on top of the regular programme (Wolfensberger, De Jong, & Drayer, 2012). Students often work in small project groups, with approximately twenty students, doing either a research project or projects commissioned by a stakeholder outside the school (Wolfensberger, De Jong, & Drayer, 2012; Wolfensberger, Van Eijl, & Pilot, 2012). These project groups incite self-directed learning and require collaboration (Van Eijl & Pilot, 2019).

Students' and teachers' perceptions

Teachers' perceptions on teaching and learning influence the way they design educational programmes. Subsequently, the programme they design influences student learning (Trigwell, Prosser, & Waterhouse, 1999). In addition to teachers' perceptions, students' own perceptions on the learning environment, based on their previous experiences, affect their learning (Elen & Lowyck, 2000; Entwistle, 1991). The way students perceive their learning environment influences their study behaviour. It may result in a deep or surface approach of learning and consequently influence their learning results (Lizzio, Wilson, & Simons, 2002; Ramsden, 1997). So, whatever the intentions of the teachers may be (the so-called intended curriculum), the students' perceptions of the curriculum may strongly affect what they learn from it (the so-called

achieved curriculum) (Lizzio et al., 2002; Ramsden, 1997; Van den Akker, 1997).

In the present study, we investigate the congruence and differences between the perceptions of students and teachers. Previous studies show congruence in students' and teachers' perceptions of teachers' immediacy behaviour and students' learning (Gorham & Zakahi, 1990). However, divergence in teachers' and students' perceptions is more prevalent. These perceptions concerned the research-intensive character of the learning environment (Visser-Wijnveen et al., 2012), the elaborateness of feedback (Montgomery & Baker, 2007; Zhan, 2016) and the knowledge and skills assessed in (intermediate) assessments (Day et al., 2018; Ruiz-Gallardo, Ruiz, & Ureña, 2013). In addition, teachers appear to have more positive perceptions on assessment than their students (Ruiz-Gallardo, Ruiz, & Ureña, 2013). Incongruence between students' and teachers' perceptions is a widespread phenomenon, in both higher education and secondary education: teachers tend to have more positive perceptions on, for example, their instructional behaviour than their students (Brekelmans et al., 2001; Den Brok et al., 2002; Den Brok, Bergen, & Brekelmans, 2006). This mismatch can have negative consequences on study success (Könings et al., 2014).

Investigating perceptions of students and teachers can give insight into what constitutes challenge in an honours programme and its effect on learning. Challenge may rely on teachers' dependent factors such as giving students autonomy or the complexity of tasks, or may be related to the peer support in the learning community. Comparison of teachers' and students' views tells us what constitutes challenge and learning for them and this may help to identify ways and moments of teachers' interventions.

Research questions

In this study, we want to examine the concepts of challenge and learning in the context of honours programmes and if and how teachers and students differ in their views on challenge and learning. This study may deepen our insights in two ways. First, challenge is a crucial element in honours education and should extend the level of ability of the honours students in order to enable them to learn. Learning what constitutes challenge may help to design these programmes. Second, comparison of teachers' and students' perspectives on challenge and learning helps us to understand what constitutes challenge and learning for them. We want to find answers to the following two questions:

- (1) What are the differences between the perceptions of students and teachers in terms of challenge and learning of the learning environment offered in honours education?
- (2) Which factors constitute challenge and learning in honours education in the perceptions of students and teachers?

The answers to these questions will give insights into what students and teachers perceive as being challenging elements, and what elements foster students' learning in the context of a challenging programme such as an honours programme. This information can be used to develop interventions and provide teachers with the means to intervene during the programme in order to develop a learning environment that students perceive as challenging. In addition, honours programmes offer a laboratory for educational innovation (Wolfensberger, van Eijl & Pilot, 2004; 2012) and can be of value for innovation in other programmes (Van Eijl & Pilot, 2019).

Method

Context

In order to investigate the concepts of challenge and learning in the context of an honours programme, we chose to study an honours programme that is purposefully based on elements of autonomy, complexity and community. The programme is offered by a University of Applied Sciences in the Netherlands and aims at developing student skills in communication, collaboration, creativeness, and critical thinking. This programme may be characterized as interdisciplinary and innovative. If students show growth during 21 weeks with independent group work and a weekly three-hour session in these four competencies, they receive a certificate and fifteen (extra-curricular) European Credits. It is an interdisciplinary programme in relation to the interdisciplinary teachers' team and with regard to the students who participate in the programme: it is open to students of all programmes. Participation is based on self-selection: those students who are interested and have obtained all 60 European Credits of the first academic year, can submit a motivation letter and later be called to attend a so-called selection day. During this day, students receive information and take part in activities to understand more about the programme, and choose to participate should they wish to join.

The programme has a rather open structure in which students and teachers design the programme in co-creation. Students and teachers work together in an interdisciplinary learning community and there are no scheduled learning activities in advance. The course setup is limited to a rough structure, based on the Design Thinking Method with an inspiration phase in which students develop ideas and take part in research to get to know the social issues of the field they wish to explore, an ideation phase aiming to contact professionals and citizens in the field and to develop plans to

work together on a social issue, and an implementation phase for the interventions students designed. Each phase is completed with a checkpoint in which students present their results so far. Hence, the programme is very much based on co-creation, community building and autonomy because students and teachers decide together what and how to study. Students face open, complex tasks. Generally they are not accustomed to do such open tasks and hence they have to create structure in the tasks themselves and need to combine academic work with the needs of stakeholders outside the class.

Participants

We investigated three academic years of the honours programme from 2016 to 2019. Both students and teachers in each academic year were asked to participate in three reflection sessions with the researchers at the end of each block (after week 7, week 15, and at the end of the programme). Table 1 provides an overview of the number of participants in the honours programme and the number of participants in the storylines.

Table 1. Number of students and teachers in the three storylines per year.

	2016-2017		2017-2018		2018-2019	
	Students	Teachers	Students	Teachers	Students	Teachers
Participants programme	16	3	8	3	14	3
Participants Storyline 1	10	3	7	2	9	3
Participants Storyline 2	8	3	6	3	9	3
Participants Storyline 3	6	3	7	3	5	3

In each year students from different educational programmes of the university, for example, Commercial Economy, International Business, and Nutrition and Dietetics, joined the honours programme. Moreover, the groups consisted of students with

different nationalities. Table 2 offers an overview of the number of different programmes and nationalities within the honours programme.

Table 2. Number of programmes and nationalities represented in the honours programme per year.

	2016-2017		2017-2018		2018-2019	
	Students	Teachers	Students	Teachers	Students	Teachers
Programmes	7	1	6	2	13	2
Nationalities	6	1	4	1	6	1

Procedure

In this study we conducted a storyline research, which is a well-explored methodology to encourage participants to rate and describe experiences in hindsight (Beijaard, Van Driel, & Verloop, 1999). Moreover, the use of storyline research is in line with previous research about honours programmes (Scager et al., 2012). We label each reflection session as a storyline.

Students and teachers participated in separate groups in the storylines. If students were unable to attend a certain time slot, they could join another student group. The groups consisted of three to five participants. The storyline sessions were scheduled in addition to the contact hours of the programme. The sessions started with a short explanation of the meeting and a short review of the meetings of the previous weeks. In each session, the participants were asked to individually rate the learning activities each week in terms of challenge and learning, and write down clarifying notes explaining their ratings. This individual data collection approach was complemented by a group discussion in which the participants were encouraged to revive their memories of the learning activities and to discuss their ratings and explanations. Participants were asked to add the insights that were aroused by the discussion to their written explanation. This

procedure was applied in separate rounds for the experienced challenges and what they had learned.

All sessions were video-taped so that difficulties in the interpretation of the written explanations could be solved by scrutinising the tapes. Before recording, permission from each participant in the session was asked. At the start of the honours programme, we explained the goal of the research to the participants, the way we respect their personal data, and the method we use to store the research data. All participants signed an informed consent. Our approach has been approved by the ethical committee of the University of Applied Sciences.

The setup of the research project draws upon design based research. In the academic years 2017-2018 and 2018-2019, the ratings of challenge and learning for teachers and students were discussed with the teachers in an additional participatory reflection session. Teachers could react on the results and respond to each other in this session. The researchers organised these sessions to enable the teachers to adapt the programme and to devise interventions in order to enhance students' learning.

Data gathering

Both students and teachers were invited to reflect on the learning activities of each week in hindsight and to rate them on a scale of -5 to +5 in terms of challenge (how difficult and demanding were the learning activities for you/for the students?) and learning (how much did you/the students learn from these learning activities?). Note that we asked the students for their own experiences and the teachers about what they thought the students experienced. They made a graph that described the activities of every week by means of key words. In addition to this quantitative reflection, students and teachers explained the decrease or increase in challenge and learning, which were added in writing.

Analysis

For the quantitative data, means and standard deviations per week were calculated.

First, we measured correlations between the students' perceived challenge and learning each academic year to check whether those two variables were indeed related, as we expected. Second, we calculated the differences between the means of students and teachers in a two-tailed distribution with a two-sample equal variance t-test. The qualitative data were analysed by two researchers. Text units as well as the identification of reasons that described the data adequately were distinguished in the data of 2016-2017. First, both researchers received consensus about the text units: a text unit consisted of every single explanation. The text units were then categorised. These categories were derived from reasons that stimulated or hampered challenge and learning. For storyline 1, both researchers composed the categories on their own, discussed them and, with minor redefinitions, reached consensus. With these redefined categories, storyline 2 was analysed by the researchers, which then led to the minor resampling of the categories. After storyline 3, there were again some minor redefinitions and adaptations. The final list of categories of reasons was used to analyse the storylines of students and teachers of 2017-2018 and 2018-2019. In 2017-2018, an extra category (about topic and content) was added to learning because this category emerged quite predominantly in that year. The final list of categories of reasons is seen in Table 3.

Table 3. Categories of reasons to describe the qualitative data.

Challenging because of:

1.	Assignments and activities
2.	Guidance by teachers and students
3.	Positive group dynamics
4.	Negative group dynamics

- | | |
|----|----------------------------------|
| 5. | Topic itself |
| 6. | General feeling, no clear reason |
| 7. | External factors |

I have **learned**:

- | | |
|----|---|
| 1. | Soft skills and [dealing with] uncomfortable situations |
| 2. | Group dynamics and group work |
| 3. | Communication skills |
| 4. | Nothing |
| 5. | About task and project |
| 6. | About topic and content |

Like in previous research on honours programmes (Scager et al., 2012) we grounded the categories of reasons in the data. However, the categories of reasons we found differentiated to those in previous research (Scager et al., 2012). Scager et al. (2012) found task complexity, which roughly coincides with assignments and activities and topics in our study; a lack of guidance, which highly overlaps with guidance by teachers and students; and high expectations, which we did not find at all in our data. We added positive and negative group dynamics, general feeling, no clear reason, and external factors (such as other exams) to complement the descriptions of reasons that reduce or enhance challenge.

In order to understand which factors constitute challenge and learning according to students and teachers, we counted the number of weeks that these reasons were prevalent (mentioned most). Secondly, we calculated per academic year the percentages for each reason based on the total number of mentioned reasons in the specific year. Finally, we related the quantitative data to the qualitative data: the three weeks with the largest differences between the mean ratings of students and teachers were scrutinised for the underlying categories of reasons that could account for these differences.

We checked the interrater reliability of the categorisation of the qualitative data by means of Cohen's kappa, and in 2016-2017 and 2017-2018 this Cohens Kappa was .87. The two researchers also composed the categories. To verify whether the categories were transferable to other researchers, a third researcher, who was not familiar with the categories, applied the categories. We randomly took three students and two teachers and the third researcher to independently rate two storylines for both challenge and learning from both 2017-2018 and 2018-2019. The interrater reliability was .65 (Cohen's κ).

Results

First, we report whether our results reveal correlations between students' perceptions of challenge and learning. Secondly, we explain the quantitative and the qualitative results of challenge: do students' and teachers' perceptions differ regarding what constitutes challenge for students? Thirdly, we show differences in students' and teachers' perceptions of learning and how they explain why students learn.

Correlations between students' perceptions of challenge and learning

To investigate whether students' perceived challenge and learning are related as assumed, we visualised their relationship per academic year and calculated the correlations (Figure 1).

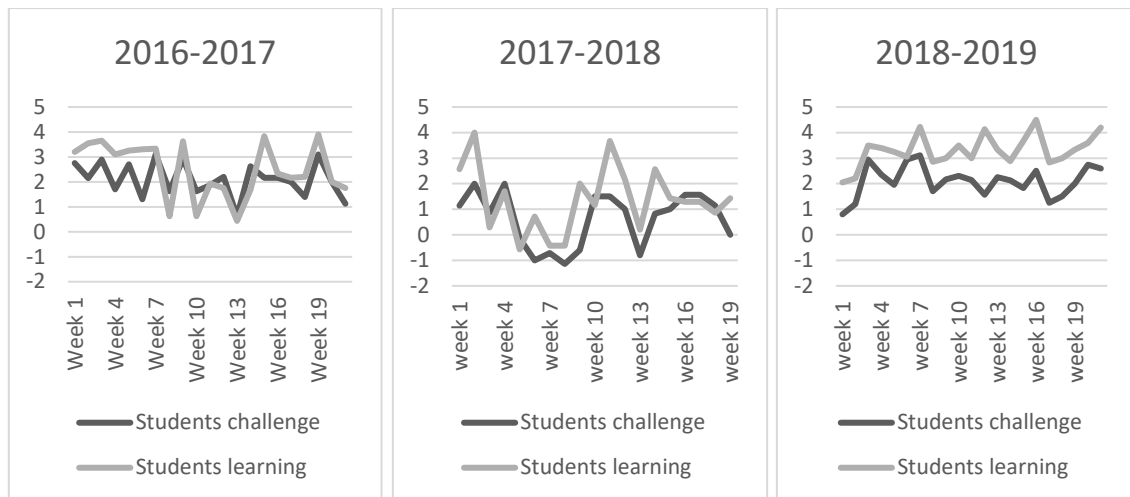


Figure 1. Students' perceptions on the extent of challenge of the activities in each week and how much they learned from it in three academic years.

In each year the correlation between challenge and learning was significant ($p < .05$). In 2016-2017 the correlation was .65 ($r(40) = 0.600, p = .000$), in 2017-2018 it was .63 ($r(36) = 0.349, p = .032$) and in 2018-2019 the correlation was .64 ($r(40) = 0.480, p = .001$).

Differences between students' and teachers' ratings on challenge

The mean ratings of students' and teachers' perceptions on challenge are visualized in the graphs below (Figure 2). Students' and teachers' views are depicted in one graph to give insight into the differences between them.

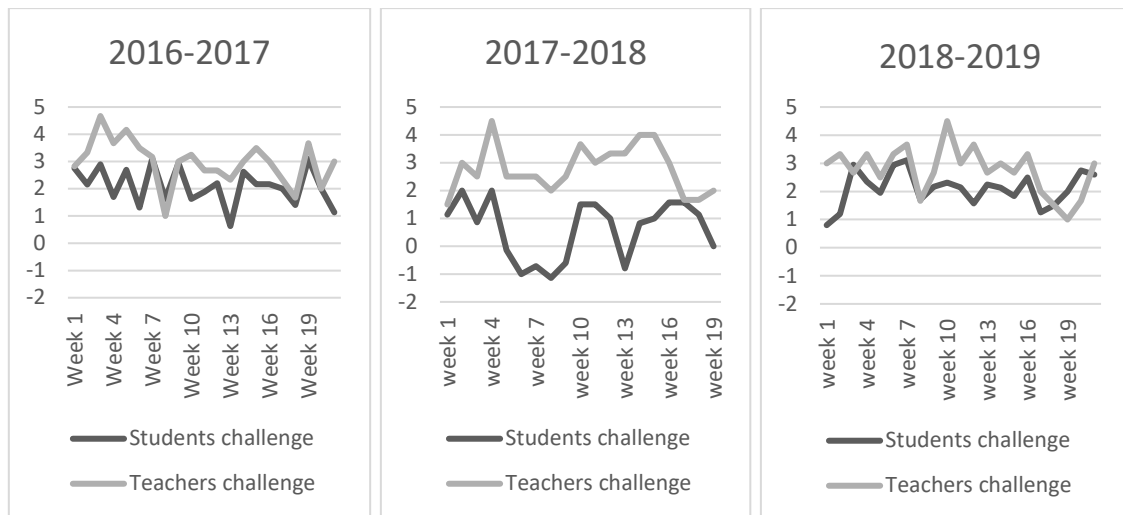


Figure 2. Students' and teachers' perceptions on the extent of challenge students perceived in each week of the honours programme. Figures are provided for three academic years.

In 2016-2017 and 2017-2018, the views of students and teachers differed significantly: $t(40) = -3.72; p < .001$ (students $M=2.10$, $SD=0.68$ and teachers $M=2.97$, $SD=0.83$) and $t(36) = -7.00; p < .001$ (students $M=0.62$, $SD=1.06$ and teachers $M=2.80$, $SD=0.86$) respectively. In these years teachers consistently viewed the programme to be more challenging than the students did. However, in 2018-2019 the perceptions of students and teachers on the challenge of the programme were much closer: the students' mean rating was 2.10 ($SD=0.61$) versus the teachers' mean of 2.77 ($SD=0.84$). In this year we did not find a significant difference ($t(40) = -2.98; p = .004843$).

In 2016-2017 the differences in perception of challenge between students and teachers are mainly at the beginning and in the middle of the programme. In 2017-2018, during the whole programme, there is a gap between students' and teachers' perceptions, due to low students' perceptions. In 2018-2019 teachers' and students' views much more converged.

Reasons for students' and teachers' perceptions on challenge

In Table 4, we provide an overview of what impacted challenge according to both students and teachers, by indicating the number of weeks that a particular reason was mentioned most. If two reasons were equally prevalent in one week, both reasons were registered. In addition, the percentages indicate how often a reason was mentioned in relation to the total number of reasons in the specific year.

Table 4. Overview of the reasons that impacted on the experienced challenge per year: the number of weeks that these reasons were prevalent and the percentages of reasons compared to the total number of reasons in that specific year.

	Number of weeks						Percentages %					
	'16-'17		'17-'18		'18-'19		'16-'17		'17-'18		'18-'19	
Reasons for challenge	S	T	S	T	S	T	S	T	S	T	S	T
Assignments activities	17	13	19	18	21	21	57.4	43.2	89.3	71.1	81.4	80.3
Guidance T and S	0	7	1	1	0	1	3.1	28.4	4.3	10.5	3.5	8.9
Positive group dynamics	1	1	0	0	0	1	4.9	6.8	2.9	2.6	4.6	3.2
Negative group dynamics	7	4	1	1	0	0	24.1	16.2	2.1	9.2	3.8	3.8
Topic itself	0	0	0	1	0	1	6.2	1.4	1.4	6.6	3.5	3.2
General feeling	0	1	0	0	0	0	2.5	4.1	0	0	0.5	0.6
External factors	0	0	0	0	0	0	1.9	0	0	0	2.7	0

NB. The number of students (S) exceeded the number of teachers (T). In addition, the number of students varied in the different storylines. Detailed information about the N of students and teachers per storyline can be found in Table 1.

What do students and teachers view as challenging for students? In the three academic years, students and teachers mentioned assignments and activities as the main factor to how challenging the students experienced the programme. Secondly, only in 2016-2017 we found a difference between students and teachers. Students mentioned negative

group dynamics as a second reason that casted a challenge for the students, whereas teachers thought that the guidance by teachers and students was a second reason that impacted challenge in that year.

To connect the quantitative and the qualitative data and hence to relate the answers on both research questions, we scrutinised the qualitative data of the three weeks with the largest differences between students and teachers. In 2016-2017, in weeks 4, 6 and 21, the perceptions of students and teachers differed most in terms of challenge. However, the explanations of the two groups only differed in week 6: students mentioned negative group dynamics ('discussions within the group are challenging'), whereas teachers mentioned guidance by teachers and students accounting for less challenge (teachers' guidance made it less challenging). The other main reasons that students and teachers put forward to explain their score corresponded together. In 2017-2018, the students' and teachers' perceptions diverged the most in weeks 6, 7 and 13. During those weeks, both groups substantiated their view with assignments and activities. In weeks 6 and 7 both groups mentioned that the activities were less challenging. In week 13 they both mentioned the activities as not challenging: teachers were doubting whether students found the assignments challenging because the discussion went well, and students mentioned that it was not challenging because 'this meeting was well prepared'. In 2018-2019, the largest differences between students and teachers emerged in weeks 1, 2 and 10 but were explained with assignments and activities by both groups. However, their view on the assignments and activities itself diverged largely. While students mentioned that assignments such as getting to know each other and observing the neighbourhood were not challenging, teachers thought that students found the start of a new programme, in English and with an activity to make a distinction between observation and interpretation, to be challenging.

Differences between students' and teachers' ratings on learning

The mean ratings of students' and teachers' perceptions on learning are visualized in the graphs below (Figure 3), with students' and teachers' views in one graph to give insight into the differences.

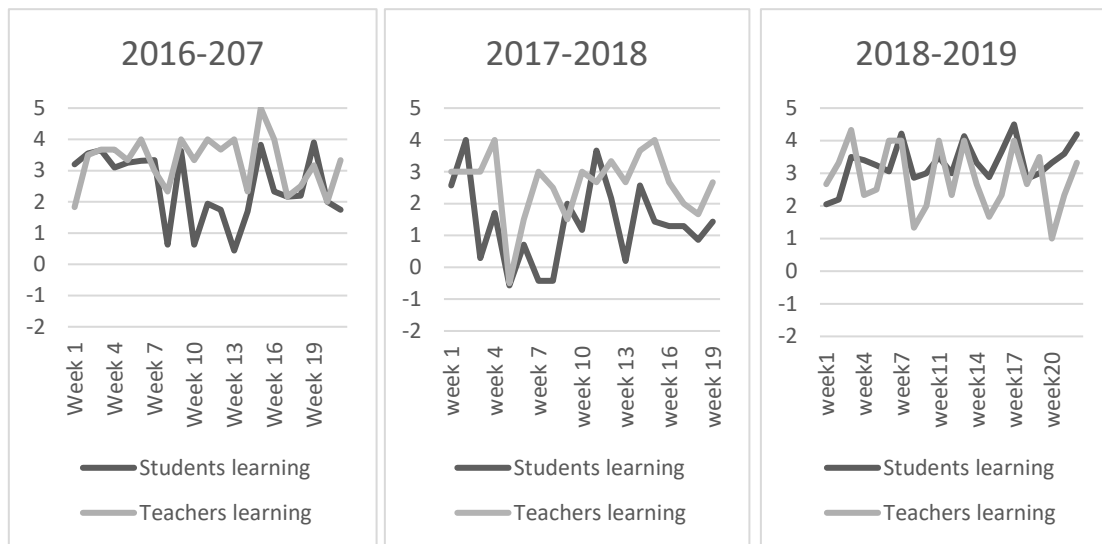


Figure 3. Students' and teachers' perceptions on how much students learned from the activities in each week of the honours programme. Figures are given for three academic years.

In 2016-2017 and 2017-2018, the views of students and teachers about the extent of learning differed significantly: $t(40) = -2.64$; $p < .05$ (students $M=2.49$, $SD=1.1$ and teachers $M=3.29$, $SD=0.82$) and $t(36) = -3.24$; $p < .01$ (students $M=1.36$, $SD=1.29$ and teachers $M=2.60$, $SD=1.05$). respectively. In 2018-2019, this pattern changed: the mean rating of students' perceptions on their learning was 3.31 ($SD=0.63$), whereas the mean rating of teachers' views on students' perceptions was ($M=2.87$, $SD=1$). This was not a significant difference ($t(40) = -1.74$; $p = .10$).

In 2016-2017 students and teachers' perceptions mainly differed in the middle of the programme due to a drop in students' perceptions of learning. In 2017-2018, several

gaps are visible between students' and teachers' perceptions. As with challenge, in 2018-2019 students' and teachers' views converged.

Different reasons for students' and teachers' perceptions of learning

In Table 5, we provide an overview of what impacted students' learning by indicating the number of weeks that these categories of reasons were mentioned most. If two reasons were equally mentioned most in one week, both reasons were registered. In addition, we give the percentages for each reason based on the total number of reasons in the specific year.

Table 5. Overview of what students learned: the number of weeks that these reasons were prevalent, and the percentages of reasons compared to the total number of reasons in that specific year.

	Number of weeks						Percentages %					
	'16-'17		'17-'18		'18-'19		'16-'17		'17-'18		'18-'19	
Explanations of learning	S	T	S	T	S	T	S	T	S	T	S	T
Soft skills uncomfortable situation	2	2	2	5	1	3	17	8.9	10.1	9.1	9.9	7
Group dynamics group work	10	6	2	4	7	1	33.5	24.4	12.2	12.1	21.2	7
Comm. skills	4	8	2	3	1	5	15.9	25.6	7.4	15.2	12.1	13.4
Nothing	2	1	8	10	0	3	12.5	8.9	31.8	28.8	11.3	15.5
Task and project	8	12	8	10	10	14	21	32.2	33.1	25.8	33.6	43.7
Topic and content	-	-	1	2	3	3	-	-	5.4	9.1	11.8	13.4

NB. The number of students exceeded the number of teachers. In addition, the number of students varied in the different storylines. Detailed information about the N of students and teachers per storyline can be found in Table 1.

In all academic years, both students and teachers indicated that task and project was an important reason for students' learning. Yet, in 2016-2017, students mentioned group

dynamics and group work as the most important reason for their learning. In 2017-2018, in addition to task and project as important reason for learning, both students and teachers mentioned 'nothing' as an explanation of students' learning. In 2018-2019 students mentioned again group dynamics and group work in addition to task and project as important reasons for their learning.

In order to understand whether differences between students' and teachers' views on the extent of learning cohered with differences in what students learned, we again investigated the qualitative data of three weeks with the largest differences per academic year. In 2016-2017, in the weeks that the perceptions of students and teachers differed most, also their explanations diverged. In week 10 the students mentioned learning from task and project ('learned to prepare better' for a checkpoint), whereas teachers thought that students learned communication skills ('giving feedback'). In week 11 students mentioned communication skills ('good to get feedback'), whereas teachers gave diverse reasons for learning. In week 13 both students and teachers mentioned learning from group dynamics and group work (gained 'insight in other people') and students additionally mentioned communication skills ('feedback'). In 2017-2018, in the weeks that the opinions of teachers and students mostly diverged, their explanations also differed strongly. In all three weeks students mentioned that they learned nothing ('experienced repetition', 'no new insights'). In one week, teachers agreed, but in addition they mentioned a variety of reasons for learning. In 2018-2019, in the weeks that students and teachers disagreed mostly about the extent of learning, they did also about what students learned. Teachers underlined communication skills as a focus for learning ('information sharing'), or admitted that students had learned nothing, whereas students mentioned group dynamic and group work ('learned how

different everyone's opinions can be'), and task and project ('evaluation is valuable, good insight in project') as learning achievements.

Discussion and conclusions

We investigated the differences between students' and teachers' perceptions on the level of challenge and students' learning within the context of honours education. Within honours education, challenge is an essential element and this constitutes students' learning (Scager et al., 2012). The honours programme we investigated can be characterised as an innovative programme in higher education with a high level of autonomy for the students and an emphasis on community building and co-creation. The autonomy enhances also the complexity of the tasks. These are also known as characteristics that challenge students and foster their learning (Scager et al., 2013; Wolfensberger, 2012). Learning is maximised if students experience a level of challenge above their ability level (Vermunt & Verloop, 1999). In line with this, we found correlations between challenge and learning in our data varying from .63 to .65. We gathered both quantitative and qualitative data in order to investigate whether perceptions of teachers and students differed and what constituted challenge and learning for teachers and students.

Differences between students' and teachers' perceptions

The first research question aimed to shed light on the extent to which students' and teachers' perceptions on the learning environment in terms of challenge and learning diverged. In 2016-2017 and 2017-2018, teachers estimated the challenge in the studied honours programme significantly higher than the students actually experienced. This was in particular the case in the middle of the programme due to low levels of challenge reported by the students. This difference between teachers and students holds also true

for learning. In 2016-2017 and 2017-2018, the teachers thought that students learned more than students actually reported. Notice that the standard deviations are high, which implies that the differences within the groups are large. The finding that students' and teachers' perception differ is in line with other studies exploring students' and teachers' perceptions in higher education (Day et al., 2018; Montgomery & Baker, 2007; Ruiz-Gallardo, Ruiz, & Ureña, 2013; Visser-Wijnveen et al., 2012; Zhan, 2016) and in secondary education (Brekelmans et al., 2011; Den Brok et al., 2002; Den Brok, Bergen, & Brekelmans, 2006). Overall, teachers tend to have more positive perceptions than their students do. However, these studies revolve around perceptions on assessment, research-based education and the instructional behaviour of teachers whereas our study sheds light on the most fundamental aspect of learning: the challenge students experience and hence their learning.

Contrary to this, in 2018-2019 there were no significant differences between students' and teachers' perceptions on the extent of challenge and learning. Because the same teachers participated throughout the three years, we might conclude that teachers were able to bridge the gap between their perceptions on challenge and learning and the students' perceptions. We may attribute this to the additional participatory reflection sessions where the teachers were confronted with the gap between their perceptions and the perceptions of the students, which urged them to implement several changes in the programme. First, the openness of the task changed: instead of choosing a topic themselves, students explored a problem commissioned by a stakeholder from the work field. Secondly, the programme structure changed: students had to go faster through the inspiration phase and less checkpoints were planned to have more time for doing their research. Third, new pedagogical methods supported group dynamics and co-creation.

What constitutes challenge and learning according to students and teachers?

With the second research question, we wanted to understand what constitutes students' challenge and learning by analysing students' and teachers' explanations for the extent of challenge and learning they perceived. Overall, students and teachers agreed highly in their view on what constituted challenge: the assignments and activities had the strongest impact while the other reasons for challenge played a less prominent role.

Only in 2016-2017 we found a difference in teachers' and students' views: as a second reason for the extent of challenge, students mentioned negative group dynamics, whereas teachers mentioned guidance of teachers and their peers. With respect to learning, both students and teachers indicated that students' learning was directed on the tasks. In addition, students mentioned learning from group dynamics and group work. In 2017-2018, both students and teachers also mentioned that students learned nothing.

Previous studies also underline the importance of the complexity of tasks in making honours education challenging (Scager et al., 2013). The complexity of assignments and tasks impacts on students' feeling of being competent as one of the basic psychological needs (Ryan & Deci, 2000). Adapting task complexity, to a level that exceeds students' ability level, may be necessary if students mention that they learn nothing. In addition, in our study students mentioned group dynamics as another important factor that influences challenge and learning: open assignments put the group dynamics under pressure and this adds to the perceived challenge of a programme and influences learning. If we relate this to the model of challenge in which autonomy, complexity and teachers' expectations play an important role in challenging honours education (Scager et al., 2013), the present study identifies two factors as pivotal: the complexity of the tasks and the group dynamics when working on open tasks. Hence, group dynamics is a factor that should not be overlooked in the design of honours

programmes. Therefore, in order to adapt the level of challenge, task complexity in relation to support for effective group dynamics seem to be important ‘buttons’ to turn.

Limitations

In this study we investigated three academic years, collecting a great amount of data of a diverse student population. The sample of teachers is limited as there were only three teachers per academic year. However, we do consider this sample of teachers as valid, because developing and teaching a programme in small teachers’ teams is common in higher education. The student sample is bigger and covers different student cohorts, which generated a reasonable data set. However we should be aware that a limited number of students chose to join this programme each year. We studied the programme within three academic years, giving us grounds to generalize our conclusions to similar honours programmes. Repetition of this study in other programmes, both honours programmes and regular programmes will deepen our insights about factors that impact students’ and teachers’ views on such a pivotal element of courses as challenge. In addition, the high standard deviations for learning imply that the differences within the groups are large. This should make us prudent with drawing conclusions (Könings et al., 2014). The research set up may mitigate this limitation; we conducted quantitative as well as qualitative research, and the latter enabled us to identify individual explanations for the mean ratings.

Practical implications and further research

Studies show that students’ and teachers’ perceptions differ (Brekelmans et al., 2011; Day et al., 2018; Den Brok et al., 2002; Den Brok, Bergen, & Brekelmans, 2006; Montgomery & Baker, 2007; Ruiz-Gallardo, Ruiz, & Ureña, 2013; Visser-Wijnveen et al., 2012; Zhan, 2016). In the current study we come to the same conclusion: students’

and teachers' perceptions on challenge and learning diverge. In addition, we conclude that teachers who are confronted with students' perceptions during the programme can effectively use this information to adapt the programme. We formulate three implications for honours education practice.

First, teachers should acquire insight in students' perceptions about the level of challenge related to their perceived ability level (cf. Scager et al., 2012). This enables teachers to adapt the complexity of the activities and to create optimal challenge for students.

A second implication is that students' learning should be monitored throughout the programme, and not just at the end. We have found a pattern with rather low student scores in the middle of the programme, which is a common pattern in long-term honours education (Coppoolse, et al., 2013). Future research can focus on a tool to monitor these perceptions. This information provides teachers with accurate information to adjust their teaching and may prevent a mismatch in students' and teachers' perceptions. Such a mismatch influences study success negatively (cf. Könings et al., 2014).

Third, we stress the importance of group dynamics in honour education (Wolfensberger, 2012). In the self-determination theory of Ryan and Deci (2000), students are challenged if they feel competent, connected and autonomous, which impacts their motivation and learning. However, our findings suggest that students feel challenged when performing tasks with a lot of autonomy (open tasks with limited instructions), which in turn can have a negative effect on group dynamics as is shown in our study. Working in groups has been underlined as often challenging (De Hei et al., 2016). We have found that the open character of tasks adds to the pressure on group dynamics. Hence, teachers should be coached on how to facilitate effective group work

(Van Eijl et al., 2017). In particular, teachers in open-structured programmes should be well equipped to coach student groups in bending negative group dynamics into more positive dynamics. Further research can shed light on the relation between autonomy and connectedness and the interventions teachers may have on their disposal.

Ethical approval

The ethical approval has been granted by The University of Applied Sciences of The Hague.

References

- Beijaard, D., Van Driel, J., & Verloop, N. (1999). Evaluation of story-line methodology in research on teachers' practical knowledge. *Studies in Educational Evaluation*, 25(1), 47-62.
- Brekelmans, M., Mainhard, T., Den Brok, P. & Wubbels, T. (2011). Teacher control and affiliation: Do students and teachers agree? *The Journal of Classroom Interaction*, 46(1), 17-26.
- Coppoolse, R., Wolfensberger, M., Van Eijl, P., Hermsen, L., Ten Berge, H., Kinkhorst, G. (2013). Honours teaching. In R. Coppoolse, P. van Eijl, A. Pilot (Eds), *Hoogvliegers. Ontwikkeling naar professionele excellentie [High flyers. Development toward professional excellence]* (pp. 127-146). Hogeschool Rotterdam: Rotterdam University Press.
- Csikszentmihalyi, M. (2000). *Beyond boredom and anxiety*. San Francisco, CA, US: Jossey-Bass.
- Day, I. N. Z., Van Blankenstein, F. M., Westenberg, P. M., & Admiraal, W. F. (2018). Teacher and student perceptions of intermediate assessment in higher education. *Educational Studies*, 44(4), 449-467. doi:10.1080/03055698.2017.1382324
- De Hei, M., Strijbos, J., Sjoer, E., & Admiraal, W. (2016). Thematic review of approaches to design group learning activities in higher education: The development of a comprehensive framework. *Educational Research Review*, 18, 33-45. doi:<https://doi.org/10.1016/j.edurev.2016.01.001>

- Den Brok, P., Bergen, T., & Brekelmans, M. (2006). Convergence and divergence between teachers' and students' perceptions of instructional behaviour in Dutch secondary education. In D. Fisher & M. Khine (Eds.), *Contemporary approaches to research on learning environments: World views* (pp. 125-160). Singapore: World Scientific. doi:10.1142/9789812774651_0006
- Den Brok, P. J., Levy, J., Rodriguez, R., & Wubbels, T. (2002). Perceptions of Asian-American and Hispanic-American teachers and their students on teacher interpersonal communication style. *Teaching and Teacher Education*, 18(4), 447-467. doi:10.1016/s0742-051x(02)00009-4
- Elen, J., & Lowyck, J. (2000). Instructional metacognitive knowledge: A qualitative study on conceptions of freshmen about instruction. *Journal of Curriculum Studies*, 32(3), 421-444. doi:10.1080/002202700182637
- Entwistle, N. J. (1991). Approaches to learning and perceptions of the learning environment: Introduction to the special issue. *Higher Education*, 22(3), 201-204. doi:10.1007/BF00132287
- Gorham, J., & Zakahi, W. R. (1990). A comparison of teacher and student perceptions of immediacy and learning: Monitoring process and product. *Communication Education*, 39(4), 354-368. doi:10.1080/03634529009378815
- Könings, K. D., Seidel, T., Brand-Gruwel, S., & Van Merriënboer, J. J. G. (2014). Differences between students' and teachers' perceptions of education: Profiles to describe congruence and friction. *Instructional Science*, 42(1), 11-30. doi:10.1007/s11251-013-9294-1
- Lizzio, A., Wilson, K., & Simons, R. (2002). University students' perceptions of the learning environment and academic outcomes: Implications for theory and practice. *Studies in Higher Education*, 27(1), 27-52. doi:10.1080/03075070120099359
- Montgomery, J. L., & Baker, W. (2007). Teacher-written feedback: Student perceptions, teacher self-assessment, and actual teacher performance. *Journal of Second Language Writing*, 16(2), 82-99. doi:10.1016/j.jslw.2007.04.002
- Ramsden, P. (1997). The context of learning in academic departments. *The Experience of Learning*, 2, 198-216.
- Ruiz-Gallardo, J. R., Ruiz, E., & Ureña, N. (2013). La evaluación en la formación inicial del profesorado: Qué creemos hacer y qué perciben los alumnos [The

- assessment in initial teacher training: What we do and what students perceive]. *Cultura, Ciencia Y Deporte*, 8(22), 17-29. doi:10.12800/ccd.v8i22.220
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78. doi:10.1037/0003-066X.55.1.68
- Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54-67. doi:<https://doi.org/10.1006/ceps.1999.1020>
- Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, 61, 101860. doi:<https://doi.org/10.1016/j.cedpsych.2020.101860>
- Scager, K., Akkerman, S. F., Pilot, A., & Wubbels, T. (2012). Challenging high-ability students. *Studies in Higher Education*, 39(4), 659-679. doi:10.1080/03075079.2012.743117
- Scager, K., Akkerman, S. F., Pilot, A., & Wubbels, T. (2013). How to persuade honors students to go the extra mile: Creating a challenging learning environment. *High Ability Studies*, 24(2), 115-134. doi:10.1080/13598139.2013.841092
- Scager, K., Akkerman, S. F., Pilot, A., & Wubbels, T. (2017). Teacher dilemmas in challenging students in higher education. *Teaching in Higher Education*, 22(3), 318-335. doi:10.1080/13562517.2016.1248392
- Stoller, R. (2004). Honors Selection Processes: A Typology and Some Reflections. *Journal of the National Collegiate Honors Council*, 5(1), 79-86.
- Trigwell, K., Prosser, M., & Waterhouse, F. (1999). Relations between teachers' approaches to teaching and students' approaches to learning. *Higher Education*, 37(1), 57-70. doi:10.1023/A:1003548313194
- Van den Akker, J. (1997). The science curriculum: Between ideals and outcomes. *The International Handbook of Science Education* (pp. 421-447). Dordrecht: Kluwer.
- Van Eijl, P., & Pilot, A. (2019). Good practices in honors education with examples to follow. *Journal of the European Honors Council*, 3(1), 1-25. doi:10.31378/jehc.87

- Van Eijl, P. J., Pilot, A., Gelink, V., & Dibo, N. (2017). Promoting talent development in honours: The Honours Experience. *Journal of the European Honors Council*, 1. 10.31378/jehc.43.)
- Van Ginkel, S., Van Eijl, P. J., Pilot, A., & Zubizarreta, J. (2012, June 20). *Ontwikkelen van een honourscommunity: een stimulans voor excellentie [Developing an honours community: a stimulus for excellence]*. Paper Onderwijs Research Dagen 2012, Wageningen, The Netherlands.
- Van Ginkel, S., Van Eijl, P. J., Zubizarreta, J., & Pilot, A. (2012). Honors in the Master's: A New Perspective? *Journal of the National Collegiate Honors Council*, 13(2), 265-278.
- Vermunt, J. D., & Verloop, N. (1999). Congruence and friction between learning and teaching. *Learning and Instruction*, 9(3), 257-280. doi:10.1016/s0959-4752(98)00028-0
- Visser-Wijnveen, G. J., Van Driel, J. H., Van der Rijst, R. M., Visser, A., & Verloop, N. (2012). Relating academics' ways of integrating research and teaching to their students' perceptions. *Studies in Higher Education*, 37(2), 219-234. doi:10.1080/03075079.2010.536913
- Wolfensberger, M.V.C., De Jong, N., & Drayer, L. (2012) *Leren excelleren, excellentieprogramma's in het HBO [Learning to Excel: Programs for Excellence in the Universities for Applied Sciences]*. Groningen/Utrecht: Hanzehogeschool/Universiteit Utrecht.
- Wolfensberger, M. V. C., Van Eijl, P. J., & Pilot, A. (2004). Honours programmes as laboratories of innovation: A perspective from the Netherlands. *Journal of the National Collegiate Honors Council*, 5(1), 115.
- Wolfensberger, M. V. C., Van Eijl, P. J., & Pilot, A. (2012). Laboratories for educational innovation: Honors programs in the Netherlands. *Journal of the National Collegiate Honors Council*, 13(2), 149.
- Wolfensberger, M. V. C. (2012). *Teaching for excellence. honors pedagogies revealed* (1. Aufl. ed.). Münster u.a: Waxmann Verlag GmbH.
- Zhan, L. (2016). Written teacher feedback: Student perceptions, teacher perceptions, and actual teacher performance. *English Language Teaching*, 9(8), 73. doi:10.5539/elt.v9n8p73