



---

## A regression analysis for business and economics students satisfaction in higher education based on assessment and feedback

Georgios Rigopoulos

Department of Economics, University of Athens, Zografou, Greece

---

### Abstract

Assessment and feedback are essential parts of effective teaching in higher education and are monitored via several tools and surveys. The annual student satisfaction survey in UK higher education is among the most popular and formal ones. It collects student feedback in order to assist institutions identify their weaknesses and improve their teaching effectiveness. Various researchers have used survey data to infer useful insights, but mostly at a high level. This study focuses on assessment and feedback as predictors for overall student satisfaction. We utilize regression analysis, and limit the scope at business and economics topics. Following the analysis, it can be concluded that there is evidence to support that assessment and feedback can be used as predictors for overall student satisfaction in business and economics. The significance of the study lies in the fact that universities consider assessment and feedback as of key importance and is thus critical to gain a better understanding on whether those factors can be safely used as predictors of overall student satisfaction. The results indicate that improved quality in marking and feedback can have a positive effect in student satisfaction. A more comprehensive study on the student satisfaction survey can unfold additional dimensions and shed light on how students perceive marking, assessment and feedback in higher education in general.

**Keywords:** student satisfaction, student assessment, student feedback

---

### Introduction

Assessment and feedback have gained a prominent importance in higher education and are considered as key factors for student satisfaction. Relevant research supports that they lead to increased motivation for academic achievements and subsequently academic progression (Bloxham, S. and Boyd, P., 2007) <sup>[4]</sup>. Two widely applied assessment approaches are formative and summative assessment (Harlen, W. & James, M., 1997) <sup>[10]</sup>. In both, feedback is considered as a critical component that influences academic behavior. Studies in various disciplines support the improvement on student engagement (Xu, Y., 2010) <sup>[20]</sup> and satisfaction (Mandal, N. K., 2019) <sup>[13]</sup> as a result of quality and individual feedback.

Following this research path, universities and academics consider feedback to students as a critical component of course design and delivery. Despite the effort, however, spent from academics to fulfil the increased demand for high quality individual feedback provision in the past years, there is little evidence on how students perceive it, or how they use it and whether it works towards their academic progression in a positive way (Higgins, R., *et al.*, 2002; Hine B., and Northeast, T., 2016; Navarro J. A. A., 2021) <sup>[11, 12, 15]</sup>. Murphy and Cornell (2019) <sup>[14]</sup> performed a focus group study among three UK universities to examine student perceptions on feedback and identified mismatch between student expectations and provided feedback. It is not only quantity, but also quality, timing, clarity that also account for students. It is thus important for educators and institutions to gain better understanding on the perception of feedback among students in order to optimize their actions. Academics, invest time to adhere to the requirements and spent considerable amount of time during marking to provide valuable feedback to students, for both formative and summative assessments. It is questionable, however, whether this approach results into students' value and on top of this, whether students perceive it as valuable and if this is reflected at student satisfaction surveys in a positive way. Universities in UK, rely on the national student survey results for student satisfaction to adapt their policies and strategies. However, not many studies exist, which explore the various dimensions of student satisfaction and whether they can be utilized as safe predictors.

This topic study aims to set the ground and explore some aspects of assessment and feedback, mainly its perception by students and the way it is measured by the UK national student survey. It focuses on the question, whether they could be used as predictors for the overall student satisfaction, an important indication for institutions and their policies. On the other hand, it provides some general insights for higher education policy makers, that could be useful for further exploration and improvement of the higher education assessment and feedback practices. Even if the dataset refers to the UK student survey, the study and the discussion is not limited to UK institutions, but it reflects some dimensions that are widely considered as important in higher education. It

is for the benefit of all institutions to adapt their educational strategies in order to incorporate some of the suggestions and improve student experience.

## Background

### Academic Performance and Student Satisfaction

Assessment and feedback mechanisms are considered as essential components for effective teaching in higher education, but they have to be perceived by students as fair and valuable, as well, in order to influence academic performance in a positive way (Perera, J., 2008) <sup>[16]</sup>. Academic performance contains formal and informal elements. The most widely known tools to measure it are summative and formative assessments (Dixson, D. D. & Worrell, F. C., 2016) <sup>[8]</sup>. Formative assessment can be defined as a collaborative process between academics and students, aiming to inform students on their progress level and at the same time provide feedback to tutors in order to align teaching to maximize student learning. Academics use it as an indicator of the achieved knowledge and skill level for students, and as a way to measure the effectiveness of their teaching. While summative assessment is formal and cumulative, is graded and signifies knowledge level, quality of learning and performance against standards <sup>[4]</sup>. Summative assessment is accounted mostly as indicator of academic performance, as it is designed to be valid and reliable, while formative is more subjective in nature. It seems that often summative feedback arrives too late for students, as they have already finished their works and might not even read it (Murphy, C. and Cornell, J., 2019) <sup>[14]</sup>. Or it might be too narrow on focus, that cannot be used in other modules in the future. So, feedback is neglected and does not contribute to academic performance, even if there is a debate on whether there exist a link between feedback and academic performance, or academic performance is mostly related to cognitive factors mainly.

In terms of factors that influence or directly affect academic performance of HE students, there is plenty of research examining from alternative dimensions (Gilar-Corbi R, 2020) <sup>[9]</sup>. The key outcome is that trying to identify valid predictors of academic performance is a complex problem and limiting them to a small number presents only a partial view <sup>[10]</sup>. It would be rather considered as a composite phenomenon, where economic and social factors are combined with personal and psychological ones contribute at specific context (Schneider, M. and Preckel, F., 2017) <sup>[19]</sup>. Schneider and Preckel (2017) <sup>[19]</sup> present an extensive review of meta analyses on higher education achievement in order to indicate factors that are associated with academic performance and they point that “institutional commitment”, which reflects students’ satisfaction with their institution shows a moderate association with academic achievements. Other empirical studies, at specific institutional contexts, indicate a moderate also association between satisfaction and performance. They attribute performance to be related to cognitive factors more rather than to satisfaction. However, they find that satisfaction is positively related to student motivation and engagement, influencing indirectly the performance (Blanz, M., 2014) <sup>[3]</sup>. In overall, studies indicate that increased student satisfaction is positively associated with increased student motivation and engagement that can lead to a better performance (Schneider, M. and Preckel, F., 2017) <sup>[19]</sup>. One way to measure student satisfaction is by student surveys, with UK annual student satisfaction survey being the most popular and formal. Student satisfaction, as measured by the survey, is a key metric for higher education institutions to prioritize actions and strategies that can increase student satisfaction, influence student performance and improve institution ranking. So, analyzing the rich survey dataset, which reflect student opinions, is a powerful way to generate valuable insights, considering of course assumptions and limitations, to avoid oversimplifications.

### Assessment and Feedback in UK Student Satisfaction Survey

The UK National Student Survey (NSS) measures student satisfaction responses and is used for UK higher education institutes ranking (Richardson, *et al.*, 2007) <sup>[17]</sup>. It was meant to support the transformation of UK higher education sector into an open market, where institutions would compete on educational services offered to students (Burgess, A., *et al.*, 2018) <sup>[6]</sup>. Regardless of the points of view, it has been one of the most influential tools for institutes and prospective students (Rodgers, T., 2011) <sup>[18]</sup>. UK universities consider NSS findings, as a valuable source of student feedback (Callendar, C., 2014) <sup>[7]</sup> and they form their strategies or amend their services to students in order to improve their quality, gain a higher rank, and attract the most motivated students (Richardson JTE., *et al.*, 2007) <sup>[17]</sup>. This is an ongoing process towards improving quality of higher education, although survey findings are not free of criticism. Vague questions, possible unreliability of quantitative data and limited qualitative data analysis are reported among others (Bennett, R., & Kane, S., 2014) <sup>[2]</sup>. The importance of assessment and feedback, and how students perceive it as part of their experience, is reflected in NSS, in a section of four questions (Table 1). Also, the student overall satisfaction on course quality is one of the questions of NSS survey (Q27) as part of the ‘Student Voice’ section and is considered as an indicator of overall student satisfaction among Higher Education Institutes (Table 1).

**Table 1:** NSS assessment and feedback section

▪ <b>Assessment and feedback Questions</b>
▪ Q8 The criteria used in marking have been clear in advance
▪ Q9 Marking and assessment has been fair
▪ Q10 Feedback on my work has been timely

▪ Q11 I have received helpful comments on my work
▪ <b>Overall satisfaction Question</b>
▪ Q27 Overall, I am satisfied with the quality of the course

University ranking tables published annually include it as a key metric among others for listing and comparing institutes, and universities use it to assess their quality of services and improve their offer at prospective students. Institutes pursue to improve this index every year by adopting strategies or trying to amend dimensions as they are represented in the NSS results. Among other factors institutes invest in time and resources to improve their assessment and feedback strategies for both pedagogical reasons and at the same time to influence positively student performance and overall satisfaction. In this study we explore the association between NSS assessment and feedback results and the overall student satisfaction metric, to check whether the four assessment and feedback questions (Table, 1) can be used as safe predictors for it, and the strength of their influence satisfaction and performance.

### Methodology and Data

The study and the analysis aim to explore whether association exists between assessment and feedback and overall student satisfaction. Also, we examine if assessment and feedback can be considered as predictor variables for overall student satisfaction at some extent. Following the background section, this study aims to unfold some aspects of assessment and feedback, locate points for improvement and discuss some policy implications. For this, a quantitative analysis of the NSS data for years 2017-2021 was performed, to identify key elements of student feedback perception. As the dataset contains a large amount of data covering all questions and subjects, the following decisions were taken to filter for Business and Economics

- The NSS questionnaire was revised at 2017, so the decision was to limit the study to years following 2017 to avoid data conversion and misinterpretation.
- The datasets we used were the ones for teaching providers, and the subjects we selected were the 'Common Aggregation Hierarchy level 1'.
- From the subject list, the 'Business and Management' subject was selected for the study.
- From the annual data files the '%Agree' answers in questions 8,9,10,11,27 were used, which correspond to the 'Definitely agree' and 'Mostly agree' responses at the five point Response scale (Response scale: Definitely agree; Mostly agree; Neither agree nor disagree; Mostly disagree; Definitely disagree; Not applicable). So, the analysis focuses on respondents who agree with the statements as expressed in the questions. This approach is in line with relevant studies and the presentation of results from Office for Students.
- All institutions were included in the analysis per year, even if there were small differences in the number of institutions per year and/or missing data.

The questions that were included in the study are the ones under the 'Assessment and Feedback' section (Q8, Q9, Q10, Q11), and the question for overall satisfaction (Q27), under the 'Overall Satisfaction' section (Table 1). Including all NSS questions in the analysis would provide a more reliable model, but it would also require the application of more advanced statistical techniques to eliminate non-contributing factors and identify possible relationships among factors. As the focus of the study was a preliminary investigation on assessment and feedback association to satisfaction, the decision was to consider only the subset of the four questions and not the total set of survey questions.

There was no clustering or selection of some representative sample, as this would require further analysis and the study was not focusing at a specific set. Some effort was performed to clean or organise data, but in general the datasets were considered as valid and accurate for the scope of this study.

So, each of the four assessment and feedback questions was set as independent or predictor variable and the satisfaction question was set as the dependent variable. For the analysis, correlation matrices were populated and in order to identify the contribution of each of the four factors (Q8, Q9, Q10, Q11) to overall satisfaction (Q27), as dependent variable, a multiple linear regression model was built with all four factors included as predictors.

### Results and Discussion

For all years (2017-2021), we found a statistically significant strong positive correlation among the four factors (Q8, Q9, Q10, and Q11) to overall satisfaction (Q27). Q8 appeared to have the strongest correlation with Q27 in most of the years, followed by Q9 and Q10. In Table 2 below, we depict correlation coefficient values selectively for the odd years.

**Table 2:** Correlation between overall student satisfaction (Q27) on assessment and feedback factors (Q8, Q9, Q10, Q11) for even years between 2017-2021

	2017					2019					2021				
	Q27	Q8	Q9	Q10	Q11	Q27	Q8	Q9	Q10	Q11	Q27	Q8	Q9	Q10	Q11
Q27 Overall, I		,617**	,513**	,620**	,566**		,620**	,582**	,549**	,576**		,636**	,683**	,560**	,601**

am satisfied with the quality of the course															
Q8 The criteria used in marking have been clear in advance			,629**	,587**	,688**			,782**	,592**	,678**			,758**	,680**	,801**
Q9 Marking and assessment has been fair				,605**	,714**				,600**	,718**				,605**	,761**
Q10 Feedback on my work has been timely					,689**					,699**					,786**
Q11 I have received helpful comments on my work															

**Note:** \*\* = Correlation is significant at the 0.01 level (2-tailed).

Results show also that moderate strong correlation among the four factors, indicating a possible shared variance in the prediction of overall satisfaction. The regression model was run for years 2017-2021 and was significant in total, so the independent variables as a group reliably predict the dependent variable (Table 3).

**Table 3:** Multiple linear regression model total significance per year

	2017	2018	2019	2020	2021
F	58.78**	78.72**	57.62**	55.28**	61.44**

**Note:** \*\* = significant at  $p < .001$ , \* = significant at  $p < .05$ , ns = not significant

The model also explained the variance of the overall satisfaction at a moderate to high degree (Table 4).

**Table 4:** Multiple linear regression model assumptions per year

	2017	2018	2019	2020	2021
Adjusted R2	.467**	.510**	.445**	.445**	.506**

**Note:** \*\* = significant at  $p < .001$ , \* = significant at  $p < .05$ , ns = not significant

The results for the significance of factors and their strength as predictors per year are summarized in Table 5.

**Table 5:** Standardised Beta coefficients for predictor variables from 2017 to 2021 for Business and Management subject

	2017	2018	2019	2020	2021
Q8 The criteria used in marking have been clear in advance	0,325**	0,489**	0,322**	0,295**	0,212*
Q9 Marking and assessment has been fair	0,082ns	0,102ns	0,113ns	0,327**	0,458**
Q10 Feedback on my work has been timely	0,375**	0,227**	0,189**	0,29**	0,191*
Q11 I have received helpful comments on my work	0,008ns	-0,015 ns	0,144ns	-0,181*	-0,067 ns

**Note:** \*\* = significant at  $p < .001$ , \* = significant at  $p < .05$ , ns = not significant

From the above, we can identify that the strongest predictor for overall satisfaction for 2017 is Q10 followed by Q8. For 2018 and 2019 Q8 is dominating, while in 2020 Q9 comes first. At 2021 Q9 is the strongest one.

Looking at the regression results (Table 6), we see that Q8 and Q10 are significant and strong predictors for all five years. While, Q9 and Q11 are not significant for three and four years respectively. This indicates that they cannot be considered as safe predictors, except for years 2020 and 2021, where we see a substantial increase of Q9 in both significance and strength. In terms of strength, we see that Q8 is the strongest predictor for years 2017-2019, while Q9 is the strongest for years 2020 and 2021.

**Table 6:** Regression of overall student satisfaction (Q27) on assessment and feedback factors (Q8, Q9, Q10, Q11) for 2017 – 2021

	2017		2018		2019		2020		2021	
Factor	B	t	B	t	B	t	B	t	B	t
Q8	,311	5,019 **	,509	7,793 **	,312	4,314 **	,267	4,045 **	,228	2,542 *
Q9	,077	1,188 ns	,105	1,620 ns	,103	1,449 ns	,293	4,094 **	,486	6,001 **
Q10	,292	5,811 **	,196	3,950 **	,159	2,969 **	,230	4,291 **	,163	2,556 *
Q11	,007	,101 ns	-,014	-,230 ns	,121	1,951 ns	-,145	-2,383 *	-,059	-,688 ns

**Note:** \*\* = significant at  $p < .001$ , \* = significant at  $p < .05$ , ns = not significant

Some relevant studies, take into account all NSS questions as factors and use the sections instead of the individual questions as predictors (Burgess, A., *et al.*, 2018; Bowles, D., *et al.*, 2020; Bell, A. R. and Brooks, C., 2018) [6, 5, 1]. They conclude that the ‘Assessment and Feedback’ factor is among the lowest scored predictors for overall satisfaction. Burgess *et al.* (2018) [6] claim also that the weak score of ‘Assessment and Feedback’ factor is more complex to analyze compared to other factors, and any corrective actions by institutes might not necessarily lead to overall satisfaction improvement. However, they acknowledge that universities did a substantial effort for more than a decade to improve the generally weak ‘Assessment and Feedback’, but they challenge its effectiveness as it looks that there is variation among subjects. This study delves deeper into the specific questions of ‘Assessment and Feedback’, focusing on a specific subject to minimize the complexity according to Burgess *et al.* (2018) [6].

Limitations of this study have to do with data selection from the NSS datasets and the limited scope. There could be some institution weighting, sampling, subject selection, another analysis method applied, to mention a few. We also agree (Richardson JTE., *et al.*, 2007) [17] that additional factors can be also important as predictors of satisfaction, but they are not included in the current NSS questionnaire.

### Conclusion

The study focuses on Business, Economics and Management subjects from the NSS dataset. Although limited in UK students, the results reflect patterns that could be met among diverse programs and countries. So, our findings can be proposed for consideration from various institutions. The key findings can be summarized as follows

- Fair marking and assessment (Q9) seems to be the strongest predictor for overall student course satisfaction for 2021. While helpful comments (Q11) was not a significant predictor at all. Q8 and Q10 were weak predictors compared to Q9.
- Clear marking criteria (Q8) and timely feedback (Q10), although important, are relatively weak predictors. So, less effort can be spent on them. Marking rubrics is a decent way towards clarity and consistent marking. While, a shift towards decoupling feedback from assessment, especially for summative one, would also be in the right direction. Both actions for Q8 and Q10, require less effort compared to Q9, as they can be part of assessment policy.
- Q11, on the other hand, although higher scored for 2021 compared to 2017 and relatively at the same level with previous years, is not significant predictor for overall satisfaction, and seems that requires a great level of investment in order to develop a homogeneous culture among educators.

For policy makers, the above results suggest that a short-term action would be to maximize student satisfaction by utilizing academic resources in an efficient way. In the long term, they should invest more on developing marking and assessment fairness, as part of educator development effort. Empowering marking and assessment quality in terms of perceived fairness would lead to greater influence towards student satisfaction and performance. The provision of clear marking criteria and timely feedback are perceived as core elements and should be included in the module design to reduce effort spent. Finally, the development of a homogeneous culture among educators for fair marking and inter module feedback would be necessary in the long term.

Concluding, this study, sets the grounds for further formal exploration of the fascinating domain of assessment and feedback, reflection on practices by academics and at the same improvement of module delivery styles. Results also point some general aspects, that could be considered at institutional level to increase student overall satisfaction. Feedback chain and assessment for learning are maybe among the two key findings that need to be sought after by institutions and academics. There is room for improvement towards a feed forward approach and shift feedback provision from a static templated form to a more interactive and engaging experience in all Higher Education institutions.

### References

1. Bell AR, Brooks C. “What makes students satisfied? A discussion and analysis of the UK’s national student survey”, *Journal of Further and Higher Education*, 2018;42(8):1118-1142.
2. Bennett R, Kane S. “Students’ interpretations of the meanings of questionnaire items in the National Student Survey”, *Quality in Higher Education*, 2014;20(2):129-164.

3. Blanz M. "How do study satisfaction and academic performance interrelate? An investigation with students of Social Work programs", *European Journal of Social Work*,2014:17(2):281-292.
4. Bloxham S, Boyd P. "Developing Effective Assessment in Higher Education". Maidenhead: Open University Press, 2007.
5. Bowles D, Sharkey G, Day C. "Psychological predictors of National Student Survey course satisfaction", *Journal of Perspectives in Applied Academic Practice*,2020:8(2):7-15.
6. Burgess A, Senior C, Moores E. "A 10-year case study on the changing determinants of university student satisfaction in the UK", *PloS one*, 2018, 13(2).
7. Callendar C, Ramsden P, Griggs J. "Review of the National Student Survey: HEFCE", 2014. <http://www.hefce.ac.uk/pubs/rereports/year/2014/nssreview/>.
8. Dixson DD, Worrell FC. "Formative and Summative Assessment in the Classroom", *Theory Into Practice*,2016:55(2):153-159.
9. Gilar-Corbi R, Pozo-Rico T, Castejón J-L, Sánchez T, Sandoval-Palis I, Vidal J. "Academic Achievement and Failure in University Studies: Motivational and Emotional Factors", *Sustainability*,2020:12(23):9798.
10. Harlen W, James M. "Assessment and Learning: differences and relationships between formative and summative assessment", *Assessment in Education: Principles, Policy & Practice*,1997:4(3):365-379.
11. Higgins R, Hartley P, Skelton A. "The conscientious consumer: reconsidering the role of assessment feedback in student learning", *Studies in Higher Education*,2002:27(1):53-64.
12. Hine B, Northeast T. "Using feed-forward strategies in higher education", *New Vistas*, repository.uwl.ac.uk, 2016, 2(1).
13. Mandal NK. "Importance of student feedback in improving mechanical engineering courses", *International Journal of Mechanical Engineering Education*,2019:47(3):227-245.
14. Murphy C, Cornell J. "Student perceptions of feedback: seeking a coherent flow", *Practitioner Research in Higher Education*,2019:4(1):41-51.
15. Navarro JAA, Cantú RA, Barón A. "Internal & external causes determining the academic performance of the university student", *RIDE. Rev. Iberoam. Investig. Desarro. Educ*, Guadalajara jul./dic. 2020 Epub, 2021, 11(21).
16. Perera J, Lee N, Win K, Perera J, Wijesuriya L. "Formative feedback to students: the mismatch between faculty perceptions and student expectations", *Medical Teacher*,2008:30(4):395-399.
17. Richardson JTE, Slater JB, Wilson J. "The National Student Survey: development, findings and implications", *Studies in Higher Education*,2007:32(5):557-80.
18. Rodgers T, Freeman R, Williams J, Kane D. "Students and the Governance of Higher Education: A UK perspective", *Tertiary Education and Management*,2011:17(3):247-60.
19. Schneider M, Preckel F. "Variables associated with achievement in higher education: A systematic review of meta-analyses", *Psychol. Bull*,2017:143:565-600.
20. Xu Y. "Examining the effects of digital feedback on student engagement and achievement". *Journal of educational computing research*,2010:43(3):275-291.