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An Analysis of Pupil Concerns regarding Transition into Higher Education

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Abstract. Transitioning to higher education is often a stressful experience, with incoming students facing similar issues year after year. This chapter presents two years of data collection regarding the concerns of Computing secondary school pupils when considering their upcoming transition into the first year of higher education. Over the two-year period, it can be seen that pupils continue to demonstrate concerns regarding topics related to money, jobs and course achievement as opposed to those related to environment or social issues. The consistency between relative areas of concern over the two years is striking, further suggesting that an understanding of these issues might help higher education institutions to better support their incoming students.

1 Introduction

Typically, the literature deals with issues relating to transition into higher education from the perspective of early undergraduates (Lowe and Cook, 2003; Krause and Coates, 2008), to better understand the issues and concerns that arise when transitioning from secondary school into a higher education environment. This chapter will also discuss implications on distance learning environments, and how these concerns are relevant to tutors and coordinators for distance learning courses.

2 Background Work

Transitioning into higher education is a very individual experience. Some students view higher education as an unknown entity, especially if they are the first in their family to go to university (Askham, 2008). These students are found to lack the cultural capital and support system needed to adequately access teaching and learning within higher education environments (Leese, 2010), as incoming students are repeatedly facing the same issues, especially within STEM (Science, Technology, Engineering and Mathematics) subjects (Hulme and De Wilde, 2015).

The issues faced by these students have been discussed in a number of publications. Yorke (2000) presents instances where students are shown to experience issues associated with financial management: students started their studies blind to this issues, and were only subject to them once they had started their studies. Ozga and Sukhnandan (1998) show that students experience several issues with managing their new lives within their new environment, both in terms of having moved far from home to a city that may be larger and busier (especially for students coming from more rural areas), and also due to the extra independence that they are suddenly awarded.

In the UK, it was reported that in the academic year 2013-14, Computer Science-related subjects suffered from low continuation rates - that is to say, 9.8% of first year students reading for a Computing-related degree failed to progress from their first year of study. This rate was the lowest across all subject areas in the country, and well above the average rate of non-continuation (6%) (HESA, 2016). This data is alarming, as it shows that even if as higher education providers, we are able to get students in the door, this has no impact on retention with regards to continuing their studies. Whilst this issue may seem to be an academic one, the authors posit that there could be additional factors at play: research shows that students may drop out due to the perceived difficulty of the course, difficulties with time management and independent learning, and a low comfort level with the 'new' environment (Kinnunen and Malmi, 2006).

A previous study by Siegel and Zarb (2016) reports the results of a survey carried out with 249 school pupils in the 2014-15 academic session about their concerns with regards to their upcoming transition into higher education Computing. The study showed that pupils were highly concerned about certain aspects of transition, including financial implications, what jobs would be available upon graduation, and what implications potential academic failure would have upon these aspirations.

The survey, and the reported conclusions, form the basis for this chapter.

3 Study

The primary objective of this research is to identify what concerns were reported by students in the 2015-16 academic session, and to establish what correlations and differences exist between that data, and data collected from a different population in the 2014-15 scholastic year. The analysis and comparison of the two sets of data will allow for an understanding of any emerging trends and ongoing issues to be developed, and recommendations for improvement to be made.

3.1 Institutional Context

The Robert Gordon University (RGU) is a public research university based in the North East of Scotland, with over 17000 students. It is one of the most northern universities in the UK, and attracts a number of students from more

rural communities. Within the School of Computing Science and Digital Media, students study a number of modules per semester, with two semesters spread across one academic year.

Within Scottish higher education, home students (at the time of writing, a classification consisting of students from Scotland as well as the European Union) are typically eligible to have their tuition subsidised by the Students Awards Agency Scotland (SAAS), effectively allowing a fee-free degree. Students who wish to study at undergraduate level are typically required to complete a set of national exams colloquially known as 'Highers' to meet a university's entry requirements - these can vary by department and by institution. These exams are taken by most students at age 16-17.

3.2 Participants

Through the use of mailing lists, social media and departmental contacts, a number of teachers across Scotland were contacted, requesting their pupils' participation. Teachers that replied to the first contact were sent a more detailed proposal, outlining the aims and objectives of the study. Teachers whose classes had previously participated in the study were asked to exclude repeat participants so as to avoid bias due to incomplete follow-up. Furthermore, this allowed for the survey to be replicated more widely, allowing for a larger user base to be gathered.

A total of 307 students from 16 secondary schools across Scotland agreed to participate in the data collection exercise, which was carried out over the course of a few months. This was an increase over the number of participants from the previous session. Three of the schools had taken part in the previous session. All pupils were asked to anonymously fill in a survey which aimed to gather student concerns. To allow for comparisons between years, the same survey was used as in the previous session of data collection.

3.3 Method

Whilst in the previous session participation was only available following face-to-face sessions, due to feedback from more rural communities and due to restrictions within the schools' timetables, it was decided to also allow participation through an online survey administered via Google Forms. Teachers were asked to select their preferred method of participation when signing up to the study. In either case, the participant pool was limited to students in their final year of studies pre-higher education, as these were considered to be on the cusp of transition. Both versions of the survey consisted of the same questions.

All teachers opted to use the online sessions for data collection, and in some cases, requested that academics visited the school to provide context.

Face-to-Face Sessions Academics from RGU arranged to visit each school to deliver a lecture on a topic agreed with the teacher in advance - these topics

ranged from project management, to transitions, to a generic 'life at university' talk. Prior to the lecture, the academic asked each pupil to anonymously fill in the online survey which aimed to gather student concerns.

Online Sessions All invited teachers were sent a link to the Google Form and asked to distribute this among their class during a supervised session. The online sessions were well received as they required less buy-in time for teachers. Furthermore, due to the framework in which Google Forms operate, the researchers were able to easily send each school anonymised automatically-generated charts summarising pupil concerns, thus allowing for teachers to organise feedback sessions with their pupils.

3.4 Survey

The survey delivered was the standard survey used in the previous study (Siegel and Zarb, 2016), consisting of Likert-scale questions grouped into the following larger topic areas:

- Academic Environment;
- Academic Staff;
- Academic Work and Workload;
- Accessibility;
- Homesickness;
- Housing;
- Job-related Concerns;
- Money; and
- Social Concerns

The aim was to gather anonymous responses from high school pupils regarding their concerns when faced with the transition to higher education, specifically within Computing-related subjects. Due to the change in delivery format, a note was appended to the start of the survey instructing pupils that all questions were optional, and that no identifying data would be collected.

All collected data was anonymous - the only identifier was the pupils' school name, as this allowed for a geographical visualisation of the data, and for the author to feed data back to the various schools upon request. It is currently anticipated that trends and patterns could be mapped to certain geographical communities (for example, would concerns differ between rural and urban schools, or schools with differing socioeconomical status?). This topic is intended for future discussion, and outside the remit of this paper.

4 Data Analysis

This section will discuss the gathered data, grouped by question. Within each section, mean (M) and standard deviation (SD) values are reported for each

question, across both years of data collection. Within the tables, Year 1 represents data collected in the 2014-15 session, and Year 2 represents data collected in the 2015-16 session. For each concern, M ranges from 0 (No Concern) to 4 (Major Concern).

Whilst data from both years is collected and presented, the purpose of this exercise is not to statistically compare and contrast individual data points across years, but to understand emerging trends and to present what recommendations can be made with regards to the self-reported concerns about the pupils' upcoming transition to higher education. This understanding is presented in section 5.

4.1 Academic Environment

This category consisted of three questions. The mean and standard deviation of each question for both years of collection are given in Table 1 below.

Table 1. Academic Environment: M & SD

	Year 1		Year 2	
Concern	M	SD	M	SD
Class size	0.9	0.86	1.4	0.95
City size	0.9	0.87	1.3	0.94
Lecture or lab environment	1.0	0.86	1.6	0.90

It can be seen in Table 1 that there is little concern reported across the board for questions on Academic Environment.

This is consistent with data collected in the previous session, suggesting that although much effort is placed into ensuring effective learning environments at the higher education level, these items are of little concern to school pupils when considering their transition.

4.2 Academic Staff

This category consisted of three questions. The mean and standard deviation of each question for both years of collection are given in Table 2 below.

Table 2. Academic Staff: M & SD

	Year 1		Year 2	
Concern	M	SD	M	SD
Will the teaching staff be friendly?	1.2	0.87	1.8	0.89
Will staff be available to help?	1.4	0.90	2.0	0.81
Will teaching staff be interesting?	1.4	0.95	2.0	0.79

It can be seen in Table 2 that overall, pupils have reported some concern with regards to academic staff. The authors posit that this concern is largely due to the fact that pupils are considering the unknown: whilst they have had time to familiarise themselves with their current teaching staff, a transition to higher education presents a large change in terms of staffing.

It is interesting to note that pupils are most concerned about the availability and interest of staff, suggesting that pupils may be concerned about how approachable academic staff might be in higher education.

4.3 Academic Work

This category consisted of seven questions. The mean and standard deviation of each question for both years of collection are given in Table 3.

Table 3. Academic Work: M & SD

	Year 1		Year 2	
Concern	M	SD	M	SD
Will I choose the right course?	1.7	0.95	2.2	0.82
What will the workload be?	1.6	0.82	2.1	0.66
Will I manage my time well on my own?	1.5	0.93	2.0	0.79
Will I like the course?	1.5	0.97	2.1	0.82
Will I be good at the course?	1.6	0.89	2.2	0.77
Am I prepared for the course?	1.6	0.87	2.1	0.74
Will I fail, and what happens if I do so?	1.8	0.95	2.2	0.81

It can be seen in Table 3 that pupils rated all issues highly in terms of concern. As with the previous year, it is clear that pupils are worried about failing a course that they have not yet embarked on, and this is concerning from an academic point of view as this causes unnecessary anxiety early on in their university careers.

Other issues, such as the choice of correct course, preparedness, workload and likability are perhaps natural at this stage in the pupils' academic career, and there is little that can be done to mitigate these issues other than to provide clear and accessible information to pupils about their upcoming course.

The concern regarding time management is worth exploring further, as students are expected to be more independent in their learning once they reach higher education, but may not be sufficiently prepared for this increase in responsibility.

4.4 Accessibility

This category consisted of one question. The mean and standard deviation for both years of collection are given in Table 4 below.

Table 4. Accessibility: M & SD

	Year 1		Year 2	
Concern	M	SD	M	SD
Will there be adequate disability support?	1.1	1.35	1.3	1.01

It can be seen in Table 4 that there is little concern regarding Accessibility reported by pupils, as with the previous year.

The authors posit that whilst the numbers indicate low concern, pupils who did not need disability support would have rated this low on their list of concerns. Furthermore, pupils who did need disability support may have had their parent or guardian organise this support with the school, and may not have realised that this would change when accessing higher education.

4.5 Homesickness

This category consisted of four questions. The mean and standard deviation of each question for both years of collection are given in Table 5 below.

Table 5. Homesickness: M & SD

	Year 1		Year 2	
Concern	M	SD	M	SD
Missing my friends/family/pets	1.1	0.92	1.5	1.01
Distance from home	1.0	0.89	1.3	0.99
How often can I go home?	1.2	0.93	1.5	1.01
When can I go home?	1.1	0.88	1.5	1.01

It can be seen in Table 5 that there was little concern reported on the topic of Homesickness, consistent with results from the previous year.

It is interesting to note that some concern is reported for the 'distance from home' question, considering this is an area that pupils have had a certain degree of control over. Whilst there is little that can be done with regards to the actual feeling of being homesick (i.e. missing family and friends), it can usually be fairly straightforward for pupils to find out when they would be able to go home by referring to their institution's academic calendar. The authors posit that if this information is made available to students at application stage, that this might lessen this concern.

4.6 Housing

This category consisted of two questions. The mean and standard deviation of each question for both years of collection are given in Table 6 below.

Table 6. Housing: M & SD

Concern	Year 1 M	Year 1 SD	Year 2 M	Year 2 SD
Finding good quality of housing	1.5	0.83	2.0	0.87
Living with flatmates	1.4	0.91	1.9	0.93

It can be seen in Table 6 that pupils have reported concerns with regards to Housing.

For a vast majority of pupils, this is likely the first time that they would be finding alternative accommodation, and be living with people outside their immediate family.

4.7 Job-Related Concerns

This category consisted of two questions. The mean and standard deviation of each question for both years of collection are given in Table 7 below.

Table 7. Job-Related: M & SD

Concern	Year 1 M	Year 1 SD	Year 2 M	Year 2 SD
Will I find a part-time job?	1.5	0.94	2.2	0.76
Will I get a good job after graduating?	1.9	0.96	2.4	0.72

It can be seen in Table 7 that pupils have reported high concerns in relation to having a part-time job throughout their studies, and also with regards to finding a job following their chosen degree.

This survey was targeted to pupils who had indicated that they were studying a Computing-related degree. This high level of concern suggests that whilst pupils are keeping their future careers in mind when choosing their degree, they may also be concerned about what types of career their degree might lead them to.

4.8 Money

This category consisted of four questions. The mean and standard deviation of each question for both years of collection are given in Table 8 below.

It can be seen in Table 8 that high concerns were reported across questions related to the Money topic, consistent with the previous data collection. Pupils reported higher concerns for general financial issues, and for housing fees, suggesting that the concern is sourcing funding. At the stage when pupils were surveyed, they would have already applied for student loans and bursaries for

Table 8. Money: M & SD

	Year 1		Year 2	
Concern	M	SD	M	SD
General money concerns	1.8	0.87	2.2	0.72
Housing fees	1.8	0.80	2.1	0.82
Course fees	1.6	0.87	1.8	0.93
Applying for funding	1.6	0.87	1.8	0.91

their first year of higher education, but would most likely not have received a decision, thus contributing to the higher levels of concern.

4.9 Social

This category consisted of two questions. The mean and standard deviation of each question for both years of collection are given in Table 9 below.

Table 9. Social: M & SD

	Year 1		Year 2	
Concern	M	SD	M	SD
Ability to make friends	1.4	0.98	1.9	0.92
Peer pressure	0.9	0.84	1.3	1.01

It can be seen in Table 9 that some concern was reported, consistent with the previous year.

The high concern regarding the pupils' ability to make friends in the new environment is not surprising: at the stage of survey, one might conjecture that pupils may be part of an established peer group that has been cultivated over a number of years within their existing communities; with the upcoming transition in mind, this peer group would most likely be changing.

5 Discussion

It can be seen that pupils have reported on a number of concerns across several topics, which will be further compared and contrasted with the data collection from the first year in this section.

5.1 Comparison with Previous Data

Due the fact that this study was a continuation of a similar paper-based survey conducted with data collected from the 2014-15 academic school year (Siegel and

Zarb, 2016), it is informative to explore the relationships between the previously-collected data. While the previous study uses the same questions, the method differed slightly due to paper-based collection methods.

As such, it was initially predicted that significant comparisons might be reserved until after a future, second iteration of the online survey. However, initial findings were quite striking and showed significant correlation between the two data sets. In fact, it will be shown that there was very strong evidence of a positive correlation between the Year 1 and Year 2 datasets.

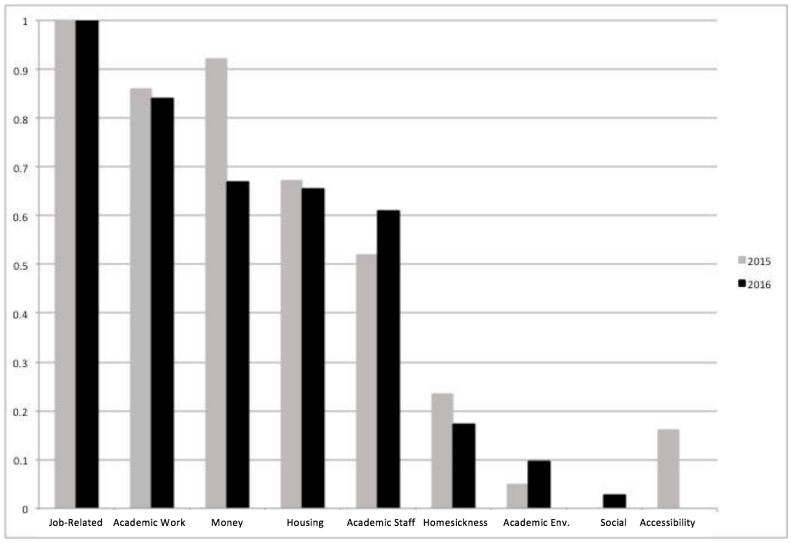

Fig. 1. Topics by Rank

Figure 1 demonstrates the ranked order of student concerns by topic, where the ranking is based on the mean response to all questions within each topic area. In the 2014-15 and 2015-16 surveys, the highest-ranking three topics of concern were: Job-Related, Money and Academic Work issues. In both years, jobs were the highest source of concern, both by question and by topic.

Similarly, the bottom three areas of concern were shared across the years. These included concerns in the areas of: Accessibility, Social and Academic Environment. While it is expected that concerns over accessibility support will vary greatly by sample, it is notable that social concerns and those regarding academic environment remain low over the two studies. It is important to note that whilst these are low on reported concern, these are two of the topics that universities might typically consider to be of most concern to students and, as such, often aim to support or target through specialised departments or programmes.

Figure 2 gives the percentile ranking of student concerns by question. The ranking is once again based on the mean response obtained for each question.

While there are certainly nuanced differences between the rankings, a notable correlation exists. For these data sets, Spearman's rank correlation coefficient (ρ) can be obtained to understand the similarity of the rankings of the responses by question. This coefficient is given by the equation $\rho = 1 - \frac{6\sum d^2}{n(n^2-1)}$, where d is the difference in ranks between each of the years and, in this case n represents the number questions, 28. For these data sets, $\rho = 0.903$, demonstrating very strong evidence of positive association between the data. That is, the rankings are very similar by question.

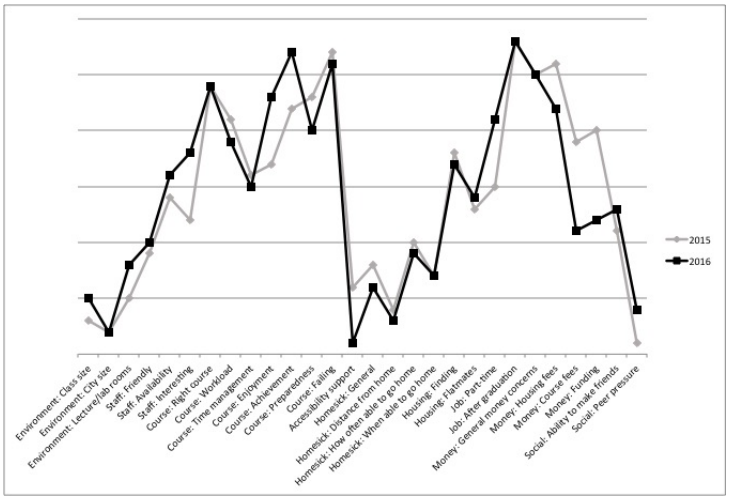

Fig. 2. Questions by Rank

Furthermore, we can look to the population Pearson correlation coefficient ($\rho_{X,Y}$) as a measure of the strength of the linear association between the two years of (unranked) data. This will help describe the degree to which the two variables are related and, specifically, how the two variables vary together. For data sets, X and Y, in our case the data from years 2014-15 and 2015-16, respectively, the population Pearson correlation coefficient is given by the equation $\rho_{X,Y} = \frac{cov(X,Y)}{\sigma_X \sigma_Y}$, where $cov(X,Y)$ is the covariance of the sets and σ_X and σ_Y represent the standard deviation of X and Y, respectively. For the collected data, $\sigma_X = 0.359$ and $\sigma_Y = 0.443$ and $cov(X,Y) = 0.145$. As such, the data has a population Pearson correlation coefficient of 0.910, which demonstrates a very strong evidence of a positive correlation. That is, when a value was high in 2014-15, there was a strong trend to also be elevated in 2015-16. Looking at a X-Y plot of the two years in Figure 3, we can see that this is, in fact, the case.

Whilst the data collected in 2015-16 shows higher concerns than the data in 2014-15, the authors posit that this is due to the fact that all data collection was done online, allowing pupils to be more honest about their concerns than

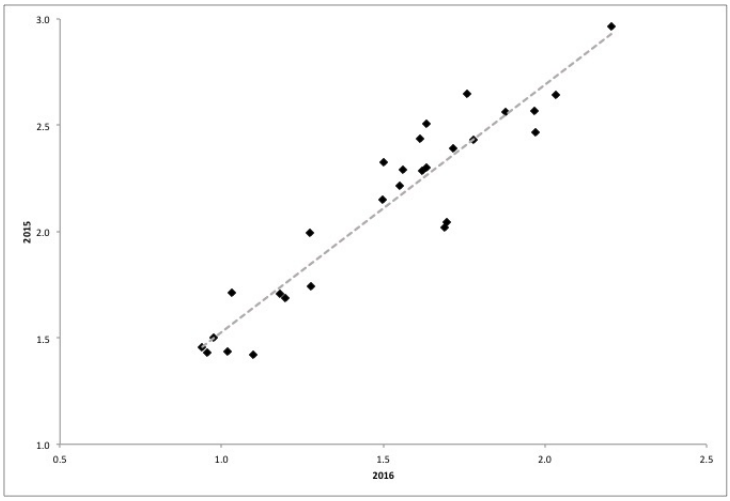

Fig. 3. Year Comparison

in the previous set of data collection, where they would typically be faced by academics and peers while completing the survey.

Further collection from future years will establish whether the patterns that are emerging at this stage can be considered trends in concern.

5.2 Recommendations

There are a number of recommendations that can be made based on these results. First and foremost, it is important that these concerns are introduced and discussed: Yorke (2000) shows that students entering higher education had to deal with issues that they had not previously considered. Whilst pupils may not be able to articulate their concerns, or may not feel comfortable doing so, it is important for both schools and universities to introduce these concerns and put this discussion on the table: this stops students from potentially feeling isolated.

Whilst data has been collected and analysed, it needs to be put into context, and an understanding of how to best support these concerns needs to be developed. Within the School of Computing Science and Digital Media at the Robert Gordon University, the work and results discussed in this chapter have been used to inform the creation of a new induction programme for all first year students. This induction aims to act as a buffer between their secondary school studies and their university life, and includes discussions on topics such as time management, independent learning, teamwork and pastoral concern. Furthermore, visualisations of the data have been created and prominently displayed in student spaces to allow as a kickstarter for discussion, both within peer groups and with academic tutors. Student reactions to this programme have been positive, and future work will consider whether this programme alleviates some of

the concerns discussed in this chapter. If it does, versions of this programme could be rolled out as necessary to promote the accessibility of higher education: for example, as posters in local communities, guidelines for distance learning, or workshops delivered at schools.

It is possible to distill a number of suggestions for better practice from this analysis, as follows. The following list of recommendations is by no means exhaustive, and is posited by the authors following multiple discussions with prospective and actual students about contextualizing the gathered data:

- Many of the reported concerns occur due to lack of knowledge on part of the applicants: issues regarding potential careers, sourcing funding and finding accommodation are concerns that may be discussed at open-door events organised by the local higher education institution such as Open Days. Too often, academics use pupil-facing activities such as school visits or community events to talk about their subject areas in detail however, the reported results show that it may be worthwhile to use these activities to open discussion on these other avenues that are of concern to applicants transitioning into higher education.
- It is important to set expectation on workload, time management and independent learning. Whilst this is something that is typically targeted during the first few days of the course, like the recommendation above, it may be worth spending some time to discuss these pre-application during pupil-facing visits to alleviate some of these concerns.
- The creation of a safe space where students can discuss non-academic issues, such as their provision to make friends, or problems encountered with living away from family. Whilst many (if not most) institutions offer a degree of student support, this is often manned by staff outside the academic department, who are often unknown to students. Exposure to these staff in class events, or provision of "known" academic staff during these sessions, may be beneficial to students.

Implications for Distance Learning The study presented in this chapter was carried out with students considering a transition into a traditional face-to-face learning environment. Despite this, some of the concerns presented here are applicable to distance learning environments - out of the 28 concerns presented in this chapter, only 9 are strictly related to a physical environment. Concerns about finance, staff, course structure and jobs are still valid, and relevant to issues found with distance learning situations.

It is shown that in a distance learning environment there is less support available to transitioning students (Clarà and Barberà, 2013); many learners feel lost, and are not given any direction or support (Kop, 2011; Mackness, Mak, and Williams, 2010). Mitigations based on the relevant concerns presented in this chapter could be therefore built into the curriculum to further assist these students.

6 Conclusions and Future Work

Over the data collection periods for this study, it can be seen that pupils continue to demonstrate concerns regarding topics related to money, jobs and course achievement over topics that are considered more traditional, such as academic environment or social issues. The consistency between relative areas of concern over the two years is striking, further suggesting that better understanding of these issues might help schools and universities to better support this group of students.

As further surveys are issued in the coming years, it will be possible to establish whether the current patterns that are presented in this paper could be considered trends in concern. Furthermore, it may be possible to undertake a statistically significant comparison between years for schools who repeatedly take part. This would allow for a detailed view of the data to hone in and understand whether there are any specific issues that are occurring which may be linked by factors such as rurality or socioeconomic status.

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