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STUDENT CONCERNS REGARDING TRANSITION INTO HIGHER EDUCATION CS

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ABSTRACT

This paper discusses a study where 249 students from 18 secondary schools around Scotland who were on the verge of applying to study Computing Science at a higher education institution were surveyed on their concerns about the upcoming transition. Preliminary conclusions from this work point to the fact that this transition process is one that seems to evolve with the student as they progress through their education, and as such, should be treated differently at various stages within that process.

CCS Concepts

• **Applied computing~Education** • *Social and professional topics~Computer science education* • *Social and professional topics~CS1* • *Social and professional topics~Computing education programs*

Keywords

Student transitions; student concerns; student issues; quantitative survey; computer science education; secondary schools; higher education.

1. INTRODUCTION

Typically, the literature deals with transitions into higher education from the perspective of early undergraduates. This paper presents a case study with data collected from over 200 secondary school students around rural Scotland in order to better understand the issues and concerns that arise when transitioning from secondary school into higher education.

2. RELATED WORK

The experience of transitioning to and starting university is a very individual one, with some students viewing higher education as an unknown entity; an ‘alien environment’ [1]. This is especially true of students who are the ‘first generation’ in their family to go to university. Thus, these students are found to lack the cultural capital needed to access teaching and learning within higher education [4].

Across STEM subjects, there is an acknowledgement of the

importance of understanding and tackling transition from pre-tertiary education into higher education [2]. The transition issue is seen as strategically important for higher education providers, as new students face similar issues surrounding this transition with every new intake.

The issues faced by these students have been discussed in a wide number of publications: Yorke [7] presents case studies of students who have problems associated with gender, class, age and financial management. In these cases, students started their higher education experience blind to these issues, and were only subject to them once they had started their studies. Ozga and Sukhnandan [6] discuss the fact that the surveyed students found difficulty with managing their lives in their ‘new’ environment, both in terms of having moved to a new locality, usually far away from what they had previously considered to be ‘home’, and also due to the amount of independence that has suddenly been afforded to them.

Transitioning into higher education also presents issues for staff, particularly those with pastoral care roles (e.g. staff with roles such as personal tutors and guidance counsellors). There is currently concern about whether students are adequately equipped with appropriate study skills for higher education (e.g. time-keeping and independent learning), and whether students might find difficulty in adjusting to the different teaching environments across the two contexts (e.g. due to a large difference in class sizes) [2].

While there are a number of studies (e.g. [3, 5]) which survey first year undergraduates about these transitions, this paper considers the secondary school students who (at the time of the study) were still considering the transition to higher in order to better understand their concerns, and how they can be supported in future.

2.1 Expectations

Based on the literature referenced above, the authors had started this work with a number of expectations about student issues. These expectations will be compared and contrasted with the findings in this work in the discussion below (section 5.3).

It should be noted that these expectations have been driven by personal experience along with a literature survey that focussed on the issues seen within early higher education.

From the literature, it can be seen that ‘environment’ is a strong theme amongst transition concerns [1, 2, 6]. Other themes encountered include the following: expectation of academic work [4] and financial management and part-time work [7]. Due to personal, pastoral experience, there was also an expectation of finding concerns regarding accessibility, distance from home, and homesickness in general.

3. INSTITUTIONAL CONTEXT

Robert Gordon University (RGU) is a public research university based in the North East of Scotland, with over 17000 students. Due to its location, it is one of the most northern universities in the UK, and as such, attracts a number of students from more rural communities. Within the School of Computing Science and Digital Media at RGU, students typically take four modules of study per semester (with two semesters across one academic year).

It is important to note that within Scottish higher education institutions, home students (a classification that includes both students from Scotland as well as the EU) are typically eligible to have their tuition subsidised by the Students Awards Agency Scotland (SAAS), effectively allowing them to undertake a fee-free degree programme.

In order to gain an offer to study at undergraduate levels, students in Scotland are required to complete a set of national exams (at the most basic level, these are known as ‘Highers’ and are taken by students during their fifth year of secondary school studies, typically at age 16).

During the year leading up to the national exams, teachers not only prepare students for the upcoming qualification, but often also discuss future career options, and highlight potential universities that could be applied to. This is often aided by university academics, who organize outreach activities for interested parties. These activities would nominally be tailored to the secondary school audience, and showcase key items from the degree programmes on offer. Within an academic body, there is mixture of concern about whether these students are appropriately equipped with the skills required by that of a higher education environment [2].

3.1 Participants

As part of RGU’s outreach strategy for the academic year of 2015-16, contact was made with a number of schools across Scotland, requesting participation. It is estimated that the average distance of these schools to the nearest higher education institution was 55 miles. All schools that replied to the initial invite were given a more detailed explanation of the aims and objectives of the study. Academics from RGU arranged to visit each school to discuss the transition process with the relevant students: at this stage, it was requested that access be given to students studying for a Computing-related Higher exam, or who had expressed an interest in studying a Computing-related subject at Higher Education. The participant pool was limited to students in their final year of high school.

A total of 249 students from 18 secondary schools around Scotland agreed to participate in the data collection exercise, which was carried out over the course of a couple of months. Each school was visited by an RGU academic, who led a discussion on university life. As part of this discussion, students were asked to anonymously fill in a survey which aimed to gather student concerns.

3.2 Survey

The aim of the survey was to gather anonymous responses from high school students regarding their concerns in relation to their upcoming transition into Higher Education. The questions within the survey was loosely based on the issues discussed within the literature, and comprised mainly of two sections: a set of 28 questions asking students to rank their concerns about the upcoming transition using a four-point Likert scale (ranging from

‘no concern’ to ‘this is a major concern for me’), as well as an additional ‘does not apply to me’ tick-box.

These questions were grouped into larger topic areas drawn from experiences and expectations discussed in section 2.1 above, as follows:

- Academic environment;
- Academic staff;
- Academic work;
- Accessibility;
- Homesickness;
- Housing;
- Job-related concerns;
- Money; and
- Social.

These were followed by a set of free-text questions which aimed to collect outlying qualitative data and generate further discussion. For the purposes of this paper, the quantitative data will be analysed and discussed, while the qualitative data will be considered in a future paper.

The survey was validated with three groups prior to its release: pastoral tutors within the university (‘foundation year coordinators’), CS1 students (asked to think about concerns they had prior to their transition) and school teachers.

At the point of data collection, the survey was kept anonymous: the only data gathered was the name of the students’ school for analytic purposes related to geographical proximity to a Higher Education provider. Students were told to fill in as many questions as they felt were necessary to adequately describe their concerns. For the purpose of data evaluation, the authors have filtered out data which was deemed to be non-applicable by the students (i.e. where students ticked the ‘does not apply’ box).

4. DATA ANALYSIS

The data collected from the surveys was initially compiled by topic area in order to direct further investigation.

Table 1: Concerns compiled by Topic Area

<i>Topic Area</i>	<i>Percentage of Students expressing Some or Major Concern</i>
Money	64%
Job-related	61%
Academic Work	55%
Housing	51%
Academic Staff	42%
Homesickness	38%
Social	31%
Accessibility	30%
Academic Environment	25%

Table 1 gives a percentage of results where students have selected either ‘some concern’ or ‘major concern’ for questions within that topic area. This allows a visualisation of the topic areas, arranged by most concerning to least concerning.

Initial inspection of the data was surprising in that concerns related to more traditional views about transitions (e.g. Family life, friends, etc.) scored quite low in comparison to other topics. In Scotland, the majority of home students get fee-free tuition, and thus when considering ‘transitions’, minimal effort is normally placed in these areas.

The following sections will consider the ‘top three’ and ‘bottom three’ issues in further detail. While it is recognised that other data is equally as important, the focus of this paper is very much about what students perceive to be concerns and issues with their forthcoming transition.

4.1 Top Concerns

The preliminary analysis (as well as Table 2 below, which depicts the top ten concerns expressed by students) shows that when considering the data by topic area, 64% of students showed concern about items related to money, with 61% of students showing concern about job-related questions. Second to these financial concerns, it is perhaps not surprising to see that students were most concerned about their academic work (55%).

Table 2: The top ten ranked student concerns

Rank	Topic	Concern
1	Job-related	Job after graduating
2	Academic Work	Will I fail? (What happens if I do?)
3	Money	General money concerns
4	Money	Housing fees
5	Academic Work	Course choice (Have I chosen the right course?)
6	Money	Course fees
7	Academic Work	Preparedness (Am I prepared?)
8	Academic Work	Will I be good at it?
9	Money	Applying for SAAS (tuition) funding
10	Academic Work	Workload amount (What will the workload be?)

4.1.1 Money

This topic area included questions about general money concerns, housing fees, course fees, and applying for SAAS (tuition) funding (Figure 1).

These issues were all highly rated by students in terms of concern, and ranked in the top 10 concerns (out of 28). Notably, few people selected the ‘no concern’ option, highlighting the questions within this topic area as being generally important.

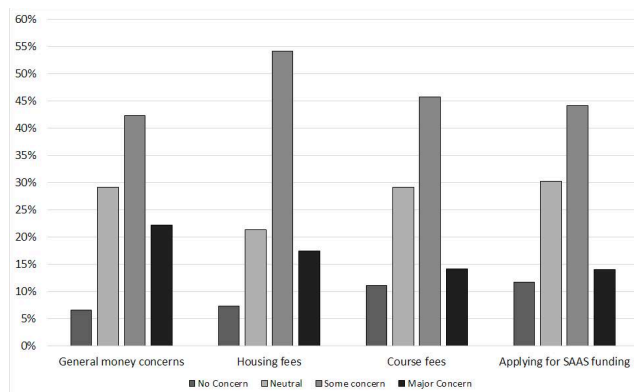


Figure 1: Concerns related to individual questions from the Money topic. Each question shows responses ranked from ‘no concern’ to ‘major concern’.

In the first three cases depicted in Figure 2, at least 60% of students had at least some concern on these issues. In the case of housing fees, 71% of students showed concern (some concern: 54%; major concern: 17%). This is likely due to the fact that while SAAS funding in Scotland covers the students’ tuition, housing fees typically are paid for by the student themselves. At the stage during which these students were surveyed, they would likely not have considered how they would be paying for these fees, nor would they have been likely to be exposed to the amount that these fees would end up being.

4.1.2 Job-Related

This topic area included questions about obtaining a full-time job after graduation, as well as their ability to find a part-time job that would support them throughout their studies (Figure 2).

These issues were all highly rated by students in terms of concern, and ranked in the top 10 concerns (out of 28).

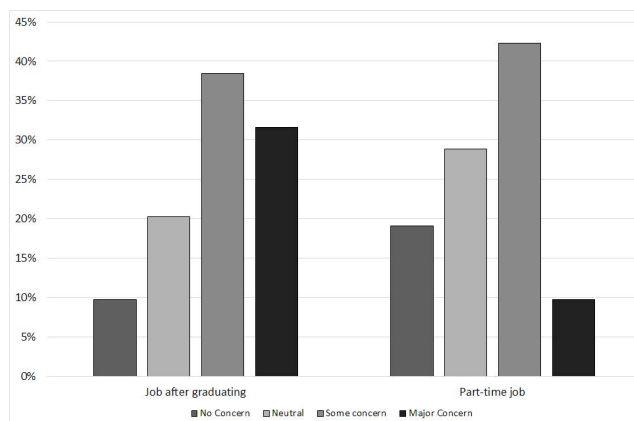


Figure 2: Concerns related to individual questions from the Job-Related topic. Each question shows responses ranked from ‘no concern’ to ‘major concern’.

The issue of obtaining a job after graduation was of greatest concern to the students: this ranked as the top concern when compared to all 28 questions. Notably, 32% of respondents considered this to be a major concern (with a total of 70% of students having shown at least some concern).

It is surprising, however, that 48% of students showed little concern (19%: no concern; 29%: neutral) about obtaining a part-time job during their studies. This may suggest that this survey

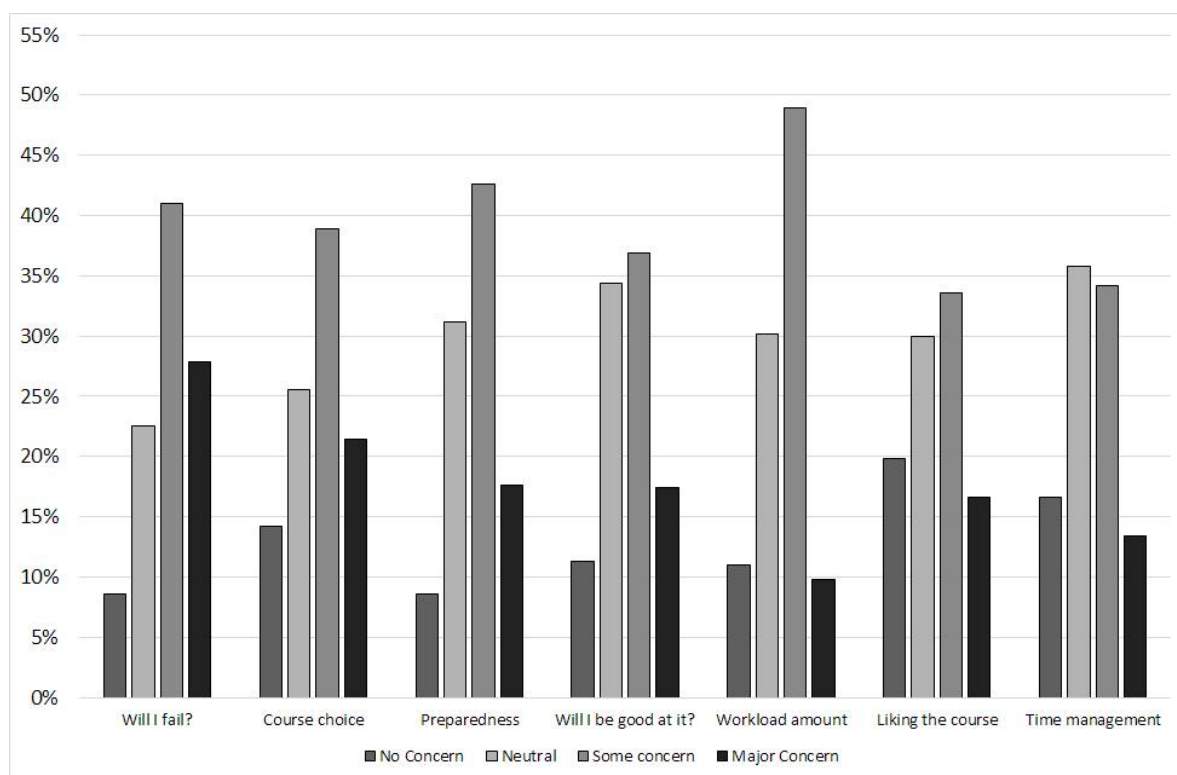


Figure 3: Concerns related to individual questions from the Academic Work topic. Each question shows responses ranked from ‘no concern’ to ‘major concern’.

was either delivered too early to them in this transitioning process, that it would be easy for them to find a part-time job, or that (at this stage) they do not plan on being employed during their studies.

4.1.3 Academic Work

This topic area included questions about potential failure, choosing the right course, being prepared for their chosen course, being good at it, the amount of expected workload, whether the course would be liked, and time management (Figure 3).

Out of these issues, all were highly rated by students in terms of concern (at least 48% of students rated each issue as being of at least some concern to them), and ranked in the top 10 concerns (out of 28), apart from ‘liking the course’ and ‘time management’. For the purposes of this section, the latter two will be discounted.

Of these issues, it is clear that students are concerned about failing a course on which they have not yet embarked. This is worrying, as it is a fear which is difficult to counteract at this stage in their education.

As money has proven to be of a high concern, it is the authors’ conjecture that the high concern with success in academic work is likely also linked to the financial ramifications of failure (e.g. cost of starting a new course following the failure of a first one).

4.2 Lowest Concerns

While many of the top concerns were not issues that could be under the direct control of the students, it is interesting to note that those items amongst the lowest concerns are issues which the students have a certain degree of control over.

The three topics which students identified as being the least concerned about were their new academic environment (25%),

accessibility services at the new institution (30%) and their social life (31%).

4.2.1 Academic Environment

This topic area included questions about the classroom environment for lectures and labs, class sizes (in terms of the number of students) and the university city size (Figure 4).

For each of these issues, at least 70% of students had no concern or were neutral. No more than 5% of students have expressed major concerns for any of these issues.

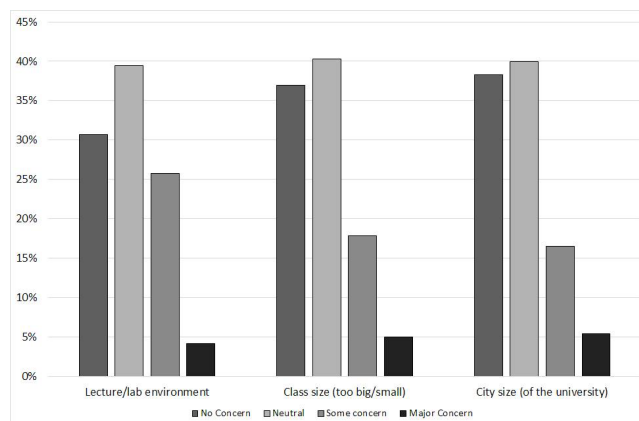


Figure 4: Concerns related to individual questions from the Academic Environment topic. Each question shows responses ranked from ‘no concern’ to ‘major concern’.

The authors find this very interesting: as a university, much effort is placed into assuring that support is provided in terms of an environment for the students to learn in. One could postulate that

either universities have succeeded in meeting this need, or that students among the ages of those surveyed are not concerned with these issues.

4.2.2 Accessibility

This topic area only included one question: that of whether the transition to higher education would come with adequate accessibility support (Figure 5). The term ‘accessibility’ is used here to indicate access to adequate disability support.

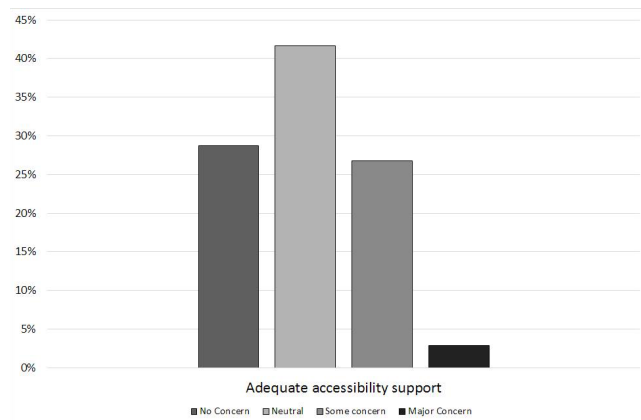


Figure 5: Concerns related to individual questions from the Accessibility topic. Each question shows responses ranked from ‘no concern’ to ‘major concern’.

It is notable that 15% of all students that took the survey chose instead to not answer this question and tick the ‘does not apply’ box. Of those that responded, a high number of students (70%) rated this as one of minimal or neutral concern. It is important to note that whilst this number ranks ‘accessibility’ as one of the lowest concerns, it was not expected that this would be a concern for all students.

Through informal interviews with both teachers and students, it is posited at this point that most students marked this question as minor because up until this point in their education, these students would largely fall into one of two categories: a) they did not require accessibility services and therefore were unaware of them; b) they did require accessibility services, but were used to their parent/legal guardian being in control of the situation, and had not considered that this might change when they transitioned to Higher Education. Furthermore, students who required accessibility services reported considering an institution that they knew would be able to support their needs, therefore expressing little concern in this area.

4.2.3 Social

This topic area included questions about being able to make friends, as well as concerns about being subject to peer pressure (Figure 6).

It is of note that among concerns that arise with students (in higher education), many of those seen by the authors have fallen under the umbrella of pastoral care and typically involve social issues. The fact that both social issues ranked in the bottom concerns was surprising.

One might conjecture that in their final years of secondary school, students are typically part of an established peer group that has been cultivated over a number of years. As such, these specific concerns might be once that students are not giving weight to.

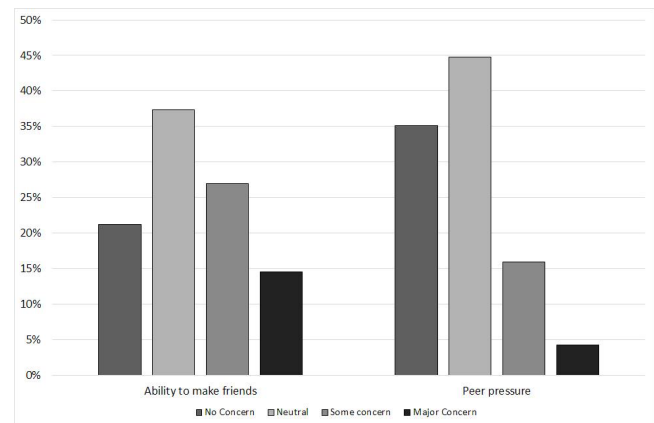


Figure 6: Concerns related to individual questions from the Social topic. Each question shows responses ranked from ‘no concern’ to ‘major concern’.

5. RESULTS AND DISCUSSION

In the top ten questions, the concerns all relate to financial and job-related issues. The bottom concerns were primarily issues related to social life, academic environment and accessibility.

5.1 Discussion of Top Concerns

From the more detailed analyses reported in section 4.1 above, certain conclusions can start to be drawn. It is interesting to note that the top two concerns rated by students (‘job after graduation’ and ‘what happens if I fail’) were items that the students have little or no control over.

It was surprising to see that finance was rated so highly as a topic of concern for students, considering the fact that students would typically not need to worry about paying their tuition fees (at least in universities within Scotland).

5.2 Discussion of Lowest Concerns

From the analyses reported in section 4.2 above, it is clear that in order to better support this transition into higher education, it is important to understand the issues that students are facing while still in secondary school.

It should also be noted that the topic of ‘homesickness’ (with questions about distance to home, missing relatives and friends, and visiting their home), which is one that is typically most associated with transitioning concerns was ranked in the bottom four. Moreover, out of the 28 questions, those related to ‘homesickness’ were ranked 20 (at most).

5.3 Overall Discussion

While the literature review focused on transition into higher education from the standpoint of undergraduates, the survey data collected was from the perspective of secondary students. The distinction is an important one to make because it can be seen that the issues/concerns experienced by these students are different from those reported by early undergraduates.

While the works within the literature (e.g. [1, 2, 6]) focus on environment, it is notable that for those secondary students surveyed, this topic did not rank highly amongst the overall list of concerns, directly opposing the initial expectations of this survey.

It should be noted, that while Yorke [7] discussed problems associated with financial management amongst other topics, he notes that the students began their university careers unaware of

these issues. However, within Scotland, it appears that secondary students, at least among those surveyed, are very aware of the financial implications of higher education and, indeed, this is a top concern to them, with both money-related and job-related concerns ranking in the top ten.

In terms of other expectations, that of academic work was a valid one, and was seen to be, in most cases, a top ten concern. However, lower concern than expected was placed by students in the areas of accessibility, distance from home, and homesickness in general.

6. CONCLUSIONS

The results in this paper indicate an agreement with a major point resulting from the studies reported by Yorke, that “some issues relating to the student experience only unfold after enrolment” [7]. Due to the variance in pre- and post-enrolment concerns, the student transition is one that must be treated appropriately according to each stage.

It is clear from the gathered data within this paper that certain topics such as the academic environment and social issues are not of great concern to these students. While anecdotally, these issues have been seen to evolve into the ones more typically seen in early undergraduate students, it is important that the issues that are of actual concern to these students are addressed at the appropriate time in their education.

There are a number of limitations to this study. First, whilst the surveyed students subscribed to a number of different ethnicities, all schools surveyed were mainly based in North-East Scotland. Second, a number of the schools surveyed were based in more rural areas. These may introduce location bias into the reported results. Finally, although academics were careful not to introduce bias into their pre-survey talk on transitions, student opinions may have been affected by that discussion, or the opinions of their classmates.

6.1 Future Work

When analysing the data, the authors were surprised to find that there was no significant concern for more ‘traditional’ transition issues, such as being apart from friends and family. It is conjectured that these concerns are absent based on the fact that university choice (in terms of location) is within the students’ control, thereby mitigating potential issues that arise from longer distances.

However, it is felt that these distance-related issues may be among those that arise even at smaller scales than expected by the students. Based on informal pastoral care discussions with university students, it is felt that these issues can also arise when the distance between university and home is not significantly large. It may benefit from being looked at in further detail: future analysis plans to consider the data geographically, to understand whether the physical distance from the nearest higher education

provider could uncover any correlation between ‘rurality’ and these issues.

The work and results discussed in this paper have been used to inform the creation of a process of extended induction which has been used with CS1 students at RGU. This induction aims to address most of the concerns reported by students, and acts as a buffer between their secondary school studies and their new university life. The preliminary work carried out for this induction is being prepared for submission as a workshop, and is currently being authored for a follow-up paper.

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