Access to success: the study of student's workload in the university pathway programs

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CONTEXT
In an increasingly interconnected and rapidly changing world, the role of a vibrant, creative and diverse engineering workforce is critical. To contribute to technological advancements, engage in global collaboration, solve complex problems, encourage a more social and leadership skill, it is necessary for future engineers to be more diverse in their racial, gender, and socioeconomic (SES) representation. Many Australian universities followed the recent government objectives aimed to increase participation in Higher Education (HE) and created courses and programmes providing alternative pathways to HE for students from non-traditional and low SES backgrounds. However, students undertaking university pathway programs, such as low Socio Economic Background (SES) students, first in family, remote and mature students often have considerable commitments that are not directly related to the study, such as job and/or career responsibilities which significantly affect their ability to progress in the course.

PURPOSE
The purpose of this study is to explore the example of Western Sydney University's The College, specifically the experiences of non-traditional students from the university pathway program studying engineering and what factors have the most influence on their workload and study success.

APPROACH
The project methodology includes a literature review, analysis of engineering pathway programs at the College and how the program parameters and student support services influence on student's success. The quantitative data of the parameters affecting student's workload and the factors affecting student's success in the pathway programs are collected across three engineering pathway programs.

RESULTS
The students from the university pathway programs, such as the Diploma and Extended Diploma in Engineering are required to spend significant amounts of time which is not directly linked to their study, such as part time job, care responsibilities and travel time. The mature-age students from Associate Degree in Engineering have a full time job and still spend significant amount of time for study. Also Associate Degree students have less care responsibilities and spend more time for social activities.
The student's success in the university pathway programs is found to be influenced by key factors, such as quality and clarity of curriculum materials, teacher characteristics, sufficient amount of face-to-face hours and study flexibility.

CONCLUSIONS
The journey for non-traditional students in the university pathway program isn't always easy and overwhelmed with the large number of personal commitments that are not directly associated with the study. However even being in the group of considerable financial disadvantage and low socio-economic status, the students found to be motivated, talented and willing to succeed in the course which evidenced by their successful progression towards university degree. It was found that a well-structured program coupled with effective student support, non-traditional students can experience high levels of success in various engineering pathway programs and can bring significant contribution to the national engineering workforce.

KEYWORDS
Engineering pathway, non-traditional students, university pathway, student workload, student success.

Introduction

University pathway programs are important part of widening participation in Higher Education (HE) in Australia and around the world. Today, pathway education courses have become very popular and are offered almost at every Australian university and are key in implementing wider participation across all demographics. Typically the courses attract a diverse range of students, some with lower academic achievement (ATAR) that can have occurred for a wide variety of reasons, incomplete schooling backgrounds, international students and mature students. Another pathway to HE undertaking rapid growth is distance and online learning as the preferred form of education available for students who would otherwise not be able to participate in traditional face-to-face courses (Ilgaz and Gülbahar, 2015; Kuo and Belland, 2016; O' Shea, Stone, and Delahunty, 2015).

Students' workload during the first year in HE or preparatory course is a contentious issue which directly impacts on student's academic performance and retention rates. One interpretation of workload essentially equates it to the number of hours worked (Kember, 2004; Tynan, Ryan, and Lamont-Mills, 2015). In this case workload is measured as the number of contact hours for classes plus the time spent on independent study. However students undertaking university pathway programs, such as low Socio Economic Status (SES) students, first in family, remote and mature students often have considerable commitments that are not directly related to the study, such as job and/or career responsibilities which significantly affect their ability to progress in the course.

It is generally believed that students entering pathways programs are less prepared for independent learning and monitoring their workload in HE. Literature and the discourse around students from low SES backgrounds in HE often adopts a deficit conception in which these students are associated with low entrance scores, decreasing standards and academic struggle and failure (Smith, 2011; Yorke and Thomas, 2003). However the recent study (McKay and Devlin, 2016) reveal that, contrary to the conception of these students as a 'problem', students from low SES backgrounds demonstrate high levels of determination and academic skills and that they actively seek high standards in their studies. These findings support observations from Western Sydney University (WSU), the College, where many students entering pathway programs were found to have a strong academic potential, but due to heavy life commitments often experience some difficulties in their study.

The university pathway programs are designed to address non-traditional students' needs by providing more face-to-face teaching hours and extra support. Thus, the data from the student's interviews from the WSU, the College suggests that time management and time poverty - limited time for study – is a concern for many students. However, yet there is a lack of quantitative data underwriting student's workload directly and indirectly related to their study which causes a limited understanding of the learner's commitments and how this impacts on the time (and the quality of time) they have to devote to study. There is also no evidence to show how the factors affecting students' workload such as time at work, traveling time and self-education time vary across courses with differences in entry parameters (open access/no ATAR or low ATAR) and there is no information how the workload of student's studying online compared with the workload of students in a face-to- face courses.

This study explores the parameters affecting student's workload in the first year of university pathway programs at the WSU, the College. The quantitative data of the parameters affecting student's workload and the factors affecting student's success in the pathway programs are collected across three engineering pathway programs.

Methodology

The quantitative data were collected at the WSU, the College from three engineering courses: Standard Diploma in Engineering, Extended Diploma in Engineering and Associate Degree in Engineering. Successful completion of the Diploma courses grants student entry

into the second year of study in the Bachelor Degrees in Engineering at the Western Sydney University. The parameters of each course are summarised in Table 1.

Table 1Parameters of each course

Program	Mode of delivery	Entry requirements	Length of study	Number of students participated in the study
Standard Diploma	Face-to-face	ATAR 50	12 months, full time	35
Extended Diploma	Face-to-face	Open access	16 months, full time	53
Associate Degree	Online	3 year industry experience	4 years, part time	21

The total 109 students agreed to participate in the study.

Student characteristics

Diploma in Engineering Students

The typical College student is a school leaver. Students are drawn from western Sydney communities where higher education participation rates are low; many are first in family to attend university and many are also from non-English speaking and/or migrant backgrounds. As a region, western Sydney has significant areas of low SES, which translates to WSU in comparison to the sector as having one of the highest participation rates of students from low SES backgrounds.

Associate Degree in Engineering Students

The students from Associate Degree in Engineering are mostly mature-age students working full time and only attending 2-3 days intensive face-to-face sessions at the College in the middle of the study term.

Data collection

The students were asked to complete the daily log book – the table where they record the time they spend on different activities during the day, such as time for study, working, career responsibilities, social activities etc. The data was collected in 2016 during week 4 in the Second Term of the Diploma Program and during week 5 in Quarter 3 of the Associate Degree Program.

The students' perception to success in academic pathway program was investigated using a ten-item scale. Students were asked to respond on a 10-point Likert scale from definitely non important or very important. The parameters, such as "curriculum design, class engagement, support services" were used. A measure of the perception of the success in the pathway program was computed by calculating the average score from each item.

RESULTS AND DISCUSSION

As a first step in data analysis from the students' diaries, we excluded data of students who did not complete any parts of the questionnaires. In addition, the data were evaluated for irregularities. Specifically, we looked for anyone who responded to each survey item with the same answers (e.g., marked "0" for all time spend for the face-to face study). From 109 engineering student participants in this study, 72 valid data sets were analysed.

Students' workload

The analysis of student workload was conducted from the student diaries were students recorded the time they spend for the different activities during the week: from Monday to Sunday. The summary of the student commitments during the weekday and the weekend for three programs – Standard Diploma in Engineering, Extended Diploma in Engineering and Associate Degree in Engineering are shown in Figure 1.

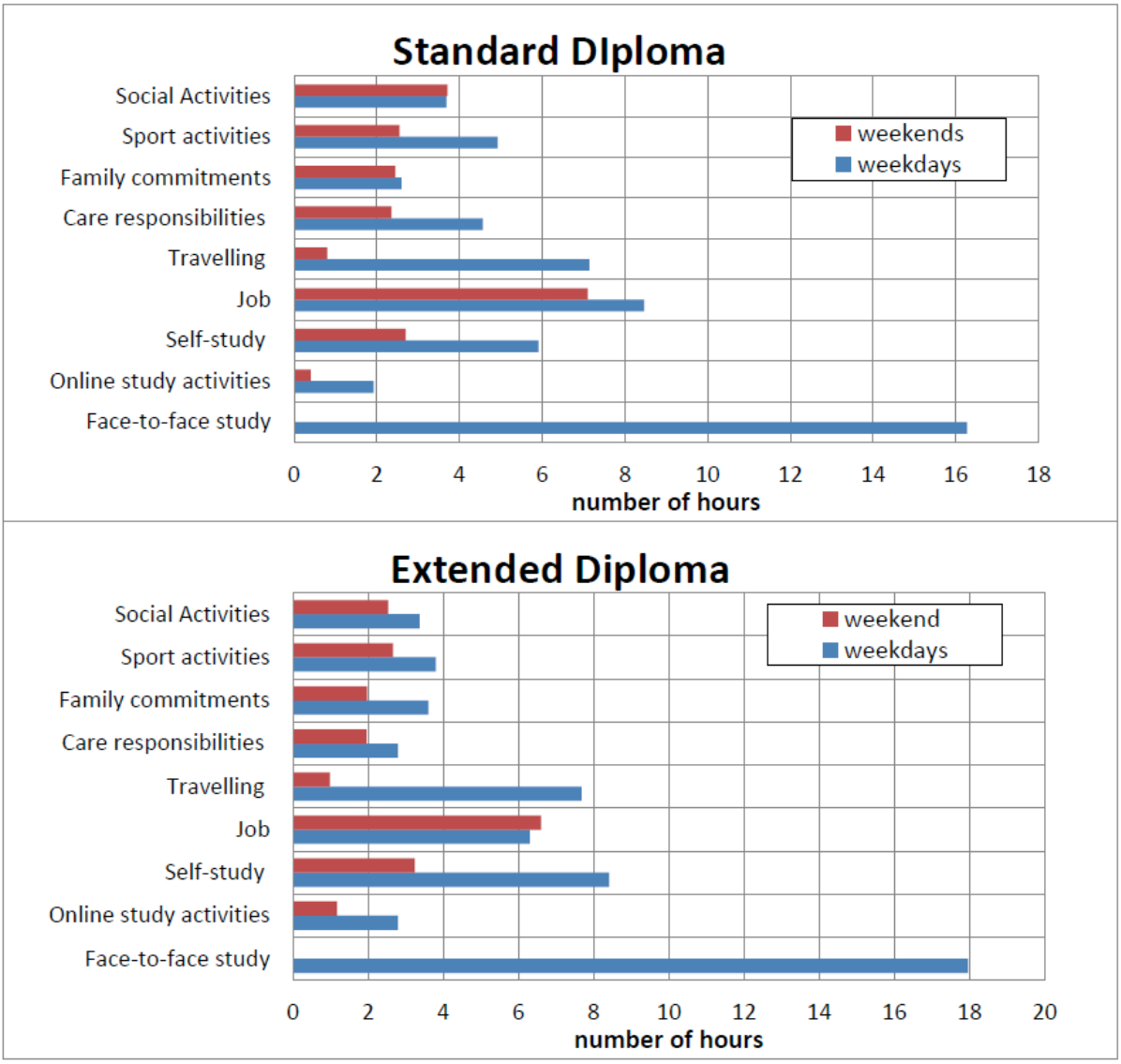

Figure 1. The summary of the Diploma student's commitments during the week.

As demonstrated in Figure 1, during the weekdays students from Diploma programs spent the largest amount of time for the face-to-face study at the College. The time is slightly higher for the extended Diploma students which correlated with their pattern of study during the term when the data was collected. Students from Extended Diploma indicated more time they spent for the self-study (5.9) compared to the students from the Standard Diploma (8.4 hours). The larger amount of time spent for the self-study by Extended Diploma students suggests that the students from an open access course are generally less prepared for the HE and require more time and effort to progress well in the study. The online activities associated with the online components used in particular subjects and shown as 1.9 hours for Standard and 2.8 hours for Extended Diploma during the weekdays.

On the weekends students indicated less time they spend on online activities and self- study compared to the weekdays and students from Extended Diploma show slightly larger amount of time they spend for study during the weekend compared to students from Standard Diploma.

Both Extended and Standard Diploma students indicated the large amount of time associated with the part time job with an average time of 8.5 hours on the weekday and 7.16 hours on the weekend for the Standard Diploma and 6.3 hours on the weekday and 6.6 hours on the weekend for Extended Diploma.

Many students indicated having care responsibilities, such as looking after siblings and parents/grandparents. The average time associated with care responsibilities are shown to be more on the weekdays which is usually related to the family responsibilities students have to share with their parents.

The significant amount of time students spend for travelling in both Standard and Extended Diploma programs. And the significant amount of travel time during the weekdays suggests that the most of time students spend to travel to and from The College.

The time associated with sport and social activities and other family commitments varies from 2 to 4 hours per week for both Standard and Extended Diploma and is slightly lower on the weekends than on the weekdays.

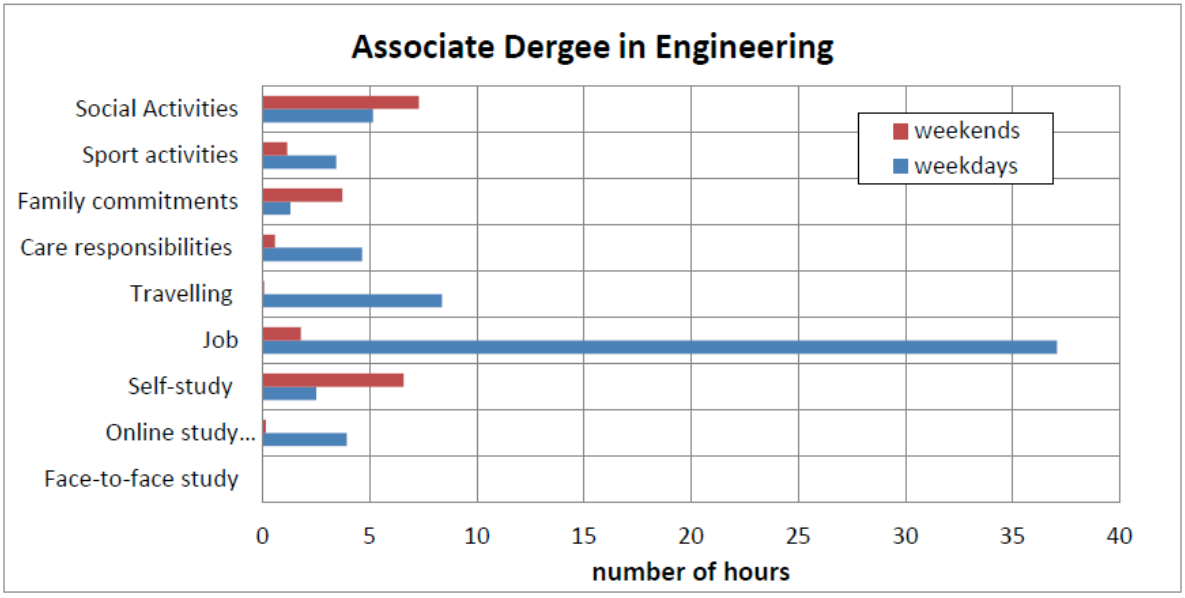

Figure 2. The summary of the Associate Degree student's commitments during the week.

Students from the Associate Degree in Engineering (Figure 2) spend 35 – 40 hours a week for the full time job. They attend online sessions during the weekdays and spend the most time for the self-study during the weekends. These students also indicated significant amount of time they spend for travelling (8.3 hours on the weekdays), but compared to Diploma students they have less care responsibilities (a total of 5.1 hours per week) and sport activities (a total of 4.4 per week). The students from Associate Degree indicated very small time they spend for work and travel during the weekends which allows them to spend more time on social activities (12.3 hours per week) and focus on self-study.

To demonstrate the overall picture of student's commitments associated with the different activities the total weekly time were summed and shown as percentage of the total time

(Figure 3). The face-to-face, online and self-study were combined in one “study” category and care responsibilities and family commitment combined to the “family” category.

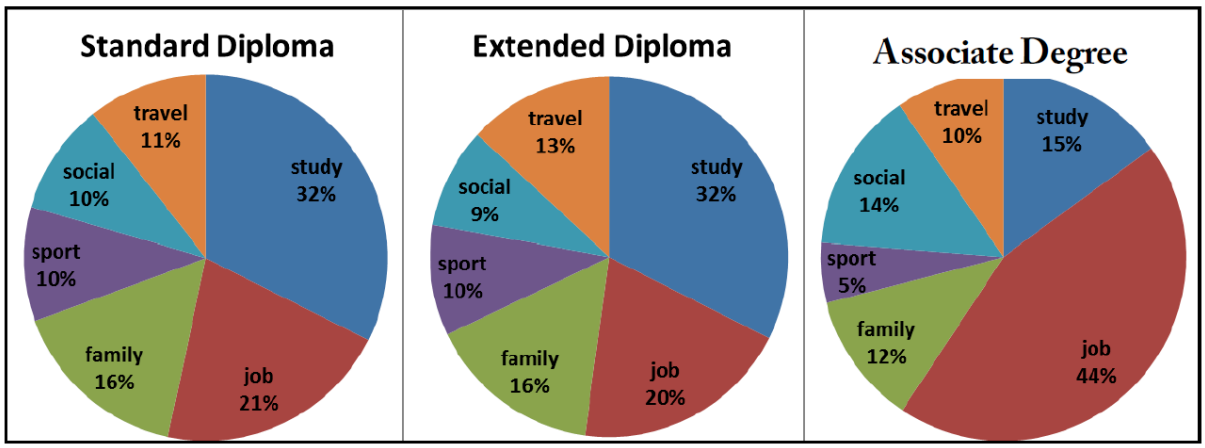

Figure 3. The comparison of student’s commitments towards the workload across three engineering programs.

As shown in Figure 3, the students from the university pathway programs, such as Diploma and Extended Diploma in Engineering are required to spend significant amount of time which is not directly linked to their study, such as part time job, care responsibilities and travel time.

The above results raise an important message that non-traditional students, such as students from the low SES backgrounds, can be less successful in the HE not just because of the previous academic achievements, but also because of the significant time they are required to denote to the non-study commitments. These students often don’t have a sufficient level of support from the family (David, 2010, Brooks, 2004; Murphy, 2009), and often need to support themselves and their family working part time or looking after young brothers and sisters.

In comparison to Diploma Programs, the students from Associate Degree in Engineering course have a full time job and do the study online. While the total number of hours the students devote to the job is doubled (44%of total hours, Figure 3), they still spend significant amounts of time for study –15% for one unit, compared to the Diploma students who spend 32% for typical 3-4 units. Also Associate Degree students spend more time for social activities, about 14%, while Diploma students often reported that they don’t have many time left for social activities.

The majority of Diploma students began their pathway course directly or relatively soon after finishing secondary school. For many students, working while studying and sharing responsibilities with the parent are essential due to their financial situation.

The students from Associate Degree in Engineering are mostly mature-age students. They have accrued significant life experience in the labour market and in a domestic setting and having full time job the students are financially independent. These students demonstrate high motivation in the study which is determined by the employment benefits, such as future career opportunities and the improvement of the current job.

Factors affecting student success in the pathway programs

The student’s success in the university pathway programs is influenced by a range of factors including motivation for study, student support within and beyond the institution, pre-entry preparation and curriculum congruence as discussed earlier (Cook-Sather, 2011; Cornelius-White and Harbaugh, 2010; Daouk, Bahous, and Bacha, 2016). Many institutions develop

their courses and support services in order to provide the best opportunities to students to succeed in their study. To evaluate the importance and effectiveness of the main factors that commonly have influence on student's success in the pathway programs, the students from Diploma and Associate Degree programs were asked to respond on a 10-point Likert scale from definitely non important (1) or very important (10). The summary of student's responses is shown in Figure 4.

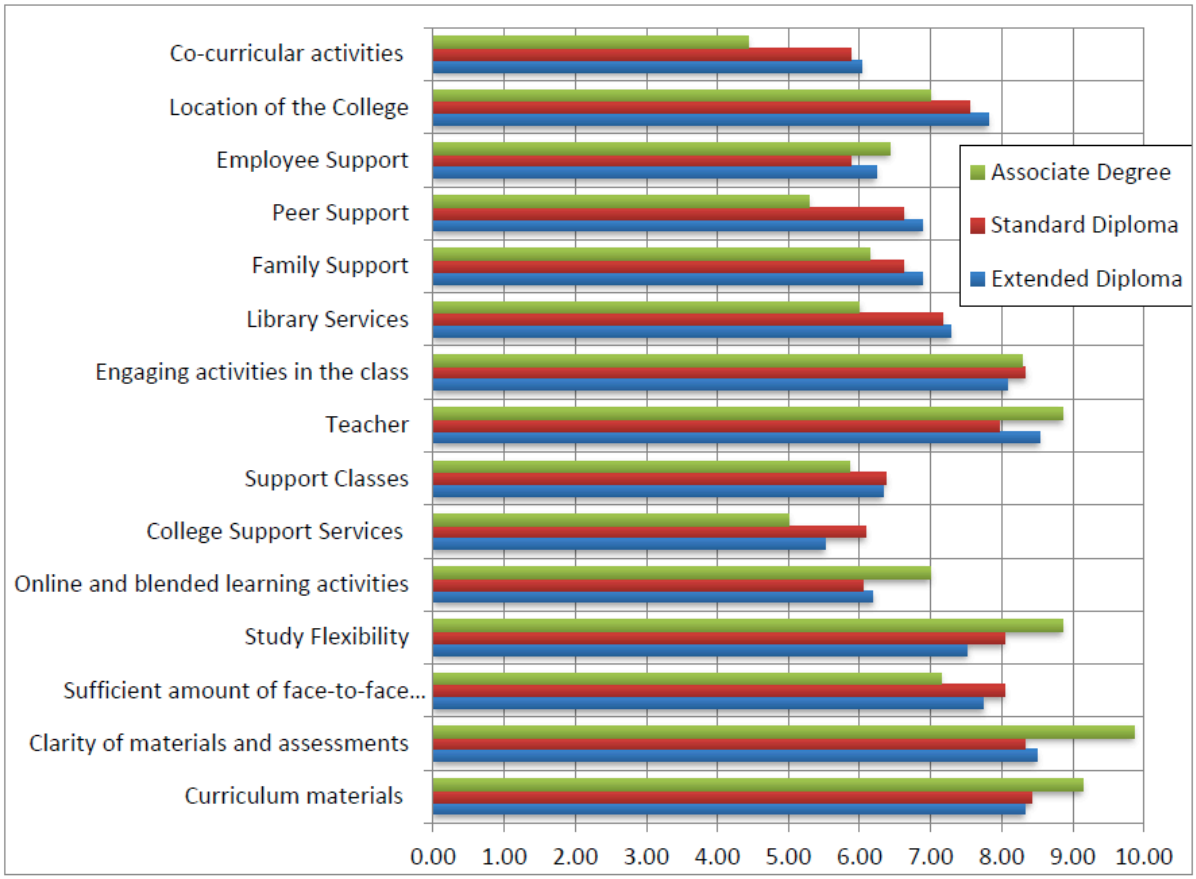

Figure 4 Student's responses on the factors they determined being important to success in the pathway program.

As demonstrated in Figure 4, the quality and the clarity of curriculum materials are the most important parameters for successful study identified by students. The students from Associate Degree indicated the clarity of materials as the top priority due to nature of the online education where the self-study dominates over the face-to-face sessions. The teacher characteristics that are also associated with engaging activities in the class are shown being important for students as well. As demonstrated earlier, the students from Diploma courses spend significant amount of time on part time work, travel and care responsibilities. While the study flexibility is shown being important for students, the sufficient amount of face-to-face classes is also shown as an important parameter for students from Diploma courses. This is because the typical students from pathway programs require more personal attention due to luck of HE skills, such as academic disadvantage, lower self-motivations and the ability to study independent outside the classroom. The mature students from Associate Degree indicated the preference of study flexibility over the face-to-face sessions. Compared to the Diploma students they also found less important institution support services, location of the College, family and peer support. These findings associated with the high level of independency of mature-age students and readiness to take initiative in self-education. Relatively less important factor students consider College's support services. While the

extensive range of support services provided to the College's students, the effectiveness and relevance of some of the services should be better evaluated. The example of good practice in promoting students support services include collaboration with academics and engaging with their course content (Alcock and Rose, 2016), developing one stop student support model (Guy and Eimer, 2016) and inclusion of support strategies into curriculum (Sentance and Csizmadia, 2016).

CONCLUSION

As demonstrated in this study, the journey for non-traditional students in the university pathway program isn't always easy and overwhelmed with the large number of personal commitments that are not directly associated with the study. However even being in the group of considerable financial disadvantage and low socio-economic status, the students found to be motivated, talented and willing to succeed in the course which evidenced by their successful progression towards university degree.

The cross-linking analysis of the main factors the students found to be valuable in their successful course progression demonstrate the importance of complex student-centred approach to support low-SES students studying in the pathway program.

This finding lends support to the notion advanced by some studies (Burian, Muhammad, Burian, and Maffei, 2012; Marcillo-Gómez and Desilus, 2016) that the social and the economic components of the socio-economic status equation may have distinct and separate influences on educational outcomes. In overall, there is increasing evidence that pathway programs are helping to release student's potentials, making it possible for more students from diverse backgrounds to study for a university degree.

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