

# Participation in higher education online: Demographics, motivators, and grit.

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## Abstract

*A preliminary analysis of a survey taken by 657 online students at Curtin University, investigating their motivation and grit. The majority of respondents were mature-aged women, nearly half were the first in their family to attend university, more than one quarter were from low SES backgrounds, and almost a quarter from regional or remote areas. In quantitative responses, students were most commonly motivated to study online by factors relating to necessity (to graduate) and passion (to improve their knowledge). Grit was found to positively correlate to motivators of necessity for male students, but not for female students. Grit was negatively associated with motivators of necessity for students under 25 years old. In qualitative responses, students were most commonly motivated by a desire for personal development, career aspirations, and family. Grit was found to positively correlate to parents' educational attainment, and to students who were not first in family to attend university.*

## Introduction

One of the growth areas for widening participation in higher education is online education. Due to the flexible nature of asynchronous education and low barriers to entry for many online courses, e-learning can work as a gateway to higher education for students entering through non-traditional pathways or who would otherwise not have access (Kim & Lee, 2011). However, retention rates for fully-online programs are lower than comparable campus-based or blended programs (Hannum et al., 2008; Jaggars, 2014). Until recently the evidence indicated that outcomes were just as good or higher for those who completed online courses (U.S. Department of Education, 2010, ctd. in Jaggars, 2014), but newer findings cast doubt on that (Jaggars, 2014). The reasons for the higher rate of attrition are still not well understood, but student grit (Duckworth et al., 2007) and institutional support (Devlin, 2013) are key factors for student success in other contexts.

This paper presents the preliminary analysis of a survey taken by 657 online students at Curtin University, which investigates their motivations for studying online and their grit. The findings include the demographics of the group and their self-reported motivators, mapped to their scores for grit (perseverance of effort and consistency of interest).

## Student attrition and success in online education

The umbrella terms “online education” and “e-learning” cover many different types of courses, ranging from Massive Open Online Courses (MOOCs) which are usually free to attend and have no formal prerequisites, Open University Australia units generally working on a pay-as-you-go model, university enabling programs, and standard university programs

offered in blended or fully online modes. While blended learning has increasingly become standard practice within universities, it is fully online education that is the focus of this paper.

Evaluation models for e-learning often focus on both institutional and student characteristics, in addition to the course and mode characteristics (Balula & Moreira, 2014, p. 8-10). Devlin (2013) has discussed the importance of collaboration between institution and student in achieving student retention and success in higher education in general, especially in relation to low socioeconomic students. Looking at what hinders and enables online students in terms of their own attributes in combination with the institution's practices offers possibilities for a managed approach to attrition focused around both student and institutional needs, leading to better expectations for success for online students, and a better institutional return for resources expended in supporting students.

From the perspective of student attributes, grit in the form of "perseverance and passion for long-term goals" has been found to be an effective indicator of educational attainment (Duckworth et al., 2007, p. 1087). Duckworth et al. found that across six studies, "grit accounted for significant incremental variance in success outcomes over and beyond that explained by IQ, to which it was not positively related" (p. 1098). Shechtman et al. (2013, p. v) argue that educational institutions have a responsibility for helping students develop non-cognitive factors such as grit within the learning environment. Grit has not previously been mapped to online higher education students.

In looking at institutional practices, Webster and Showers (2011) found that retention at colleges and universities was significantly influenced by several factors. In particular, better retention and success resulted from institutional investment in the personal attention that students received (ie. tutor/student ratio) and in higher staff salaries. Webster and Showers argue (p. 304) that it is of benefit to identify the predictor measures within the institutions themselves – rather than the demographic profile of students – which commonly promote student retention so that institutions can focus on interventions which are shown to work. Hannum et al. (2008) made a similar finding when looking specifically at online distance education in secondary schools. They found that students had a higher rate of persistence and completion when teachers had been trained in learner-centred practices adapted for the online mode, and made personal contact with students.

Recent studies by Jaggars (2014) into online community college courses in America found that online students were quite different to those who enrol in face-to-face modes: more likely to be mature age students, with dependants, and full time jobs. They were also "more advantaged: they are less likely to be ethnic minorities, less likely to be low-income, and less likely to be academically underprepared at college entry" (Jaggars, 2014). Despite that, Jaggars also found that all subgroups of online students tended to have lower achievement, retention, and completion compared to face-to-face students, and this was true even for the *same student* when comparing achievement in the different modes (Xu and Jaggars, forthcoming, ctd. in Jaggars 2014). Compounding disadvantages were also found to widen the achievement gap between online and face-to-face students.

Hodges et al. (2013) point out that attrition can be distinguished as both positive and negative, depending on the goals and aspirations of the students themselves (McInnis et al., 2000, ctd. in Hodges et al., 2013, p. 23). Non-completing students may have achieved their own goals before the end of the course, or have some other reason for discontinuing their studies, and thus can be seen as achieving a positive, or at least neutral, outcome. It is negative attrition, with its costs in terms of self-esteem and self-confidence on the student's

part, and poor economic return on the institution's, which is the problem. The Hodges et al. study is specifically focused on enabling programs, which are increasingly offered in blended and fully online modes, and provide a successful alternative pathway into higher education for disadvantaged students. Like online university courses, enabling programs also tend to have relatively high levels of attrition (p. 5). Hodges et al. further argue that enabling programs are different enough in their patterns and purpose that the measures used to track attrition in undergraduate programs are not particularly useful in this context (p. 5).

Attrition and completion are often discussed in terms of students' experiences of disadvantage. The national completion rates for students who are part-time, studying externally, remote, or mature age are all notably lower than for other groups (see Table 1).

Domestic undergraduate groups	Rate of completion (%)
<b>Total domestic completions</b>	<b>72.3%</b>
Full time students	77.7%
<b>Part time students</b>	<b>47.1%</b>
Internal students	75.4%
Multi-modal students	69.5%
<b>External students</b>	<b>44.4%</b>
High SES students	76.5%
Medium SES students	71.3%
<b>Low SES students</b>	<b>67.7%</b>
Metropolitan students	73.7%
Regional students	68.5%
<b>Remote students</b>	<b>58.3%</b>
Secondary education admission	77.4%
<b>Other basis of admission</b>	<b>68.1%</b>
19 and under	79.1%
20-24	69.2%
<b>25 and older</b>	<b>57.1%</b>

**Table 1. Completion rates of domestic bachelor students commencing in 2005 at a publicly funded university and their progression by 2012 (Commonwealth of Australia 2014).**

However, one of the key findings of Hodges et al. is that “the demographic factors figuring prominently in discussion of student attrition in undergraduate programs (including low socio-economic status, age, gender and status as first in family to attend university) do not have a significant impact on the likelihood of persistence of students in these [enabling] programs” (2013, p. 5). Rather, early engagement is key in enabling persistence. This is interesting in terms of student grit, which is measured via consistency of interest and perseverance of effort, very similar to the attributes Hodges et al. identify as important.

### **The online survey**

The focus of the online survey undertaken jointly by Curtin Teaching and Learning, and the National Centre for Student Equity in Higher Education is to understand who is studying online at Curtin, what helps online students stay motivated and engaged in learning, the attrition factors at play, and the way these map to student grit.

Via the survey, we have investigated how well four of Curtin’s online courses – enabling programs (UniReady and ITEC), Open University Australia, Curtin Online, and MOOCs – work as equity pathways to higher education, as well as the demographic and grit factors correlated to student motivation and success for online students. The survey combined both qualitative and quantitative questions about the students’ experiences with learning online. All questions were optional, and some allowed multiple answers.

Students taking the identified online courses in 2014 were invited to take the survey via email, and at the time of this preliminary analysis in February 2015, there were 657 responses.

## Findings and discussion

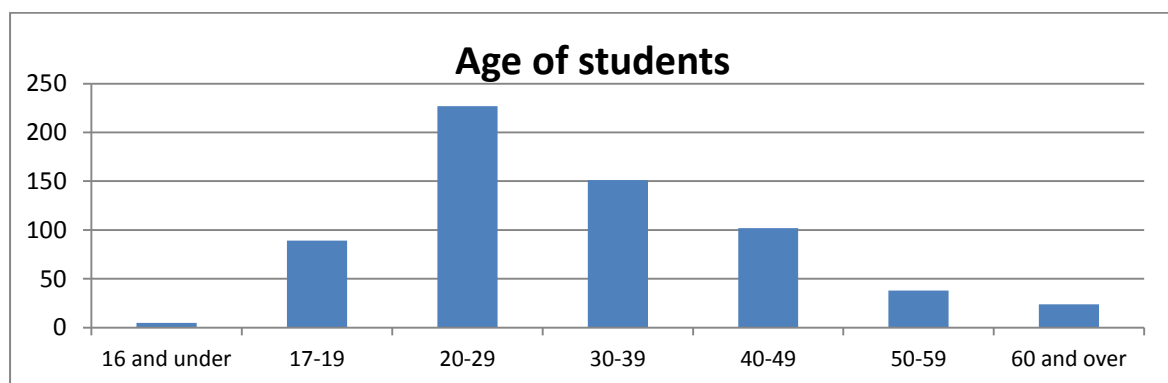
Respondents were predominantly studying Curtin Online units, or Open University units (Table 1), with 49 students taking more than one online unit when they completed the survey.

Online Mode	No. of student responses
Curtin Online unit (6 units surveyed)	244
Open University unit (4 units surveyed)	227
Unspecified online units	107
MOOC	59
UniReady (Curtin’s enabling program)	52
Not studying online	23
<b>Total response to question</b>	<b>712</b>

*Table 2. Distribution of students surveyed by online mode.*

A significant proportion of respondents of the online survey indicated they belonged to one or more groups who are likely to have experienced social disadvantage.

Women made up 75% of respondents, and 43% indicated that they were the first in their family to go to university.



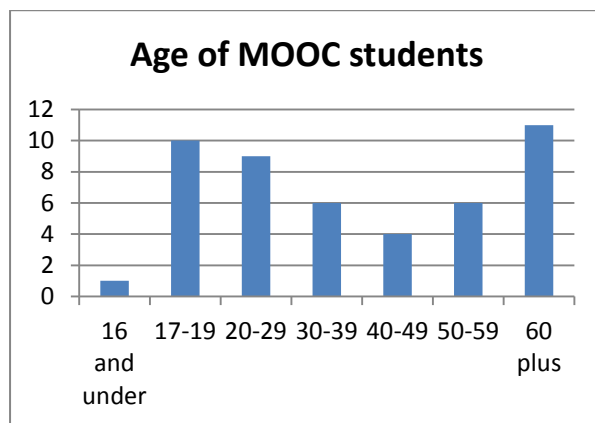
*Figure 1. Age of all survey participants.*

While there is no formal agreement on when a student officially becomes mature-aged, students become eligible for the Western Australian Mature-age Tertiary Entrance Exam at 19, with an expected start date at university at 20. The cohort who took the online survey were mostly mature age students by this measure, with 85% over 20 years of age (Fig. 1).

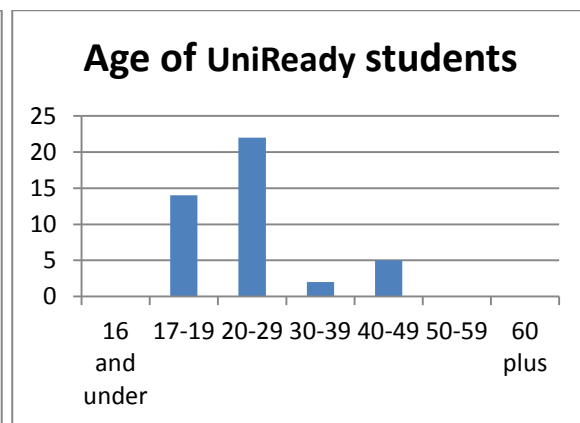
Although there is a skew to mature age students in the group as a whole, the individual cohorts within this data set show different patterns. The 59 Astronomy MOOC students had a higher proportion of teenagers and those over 60 (Fig. 2), and 71% of the MOOC students were men. Further, 17% of the MOOC students have a postgraduate degree, and 17% have an undergraduate degree.

Emanuel (2013) reported that MOOCs are more commonly used by highly educated men than students from disadvantaged backgrounds, and that pattern seems to be apparent in the Astronomy MOOC.

Compare this to the 52 students in UniReady, Curtin’s enabling program, who were 75% women, and mostly under 30 years of age (Fig. 3).



**Figure 2. Age of Astronomy MOOC students.**

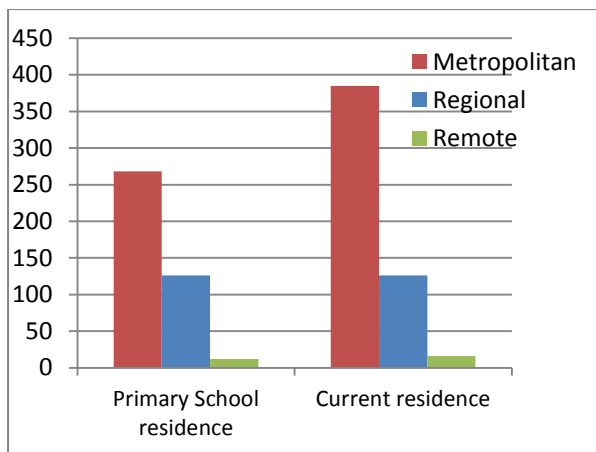


**Figure 3. Age of UniReady enabling program students.**

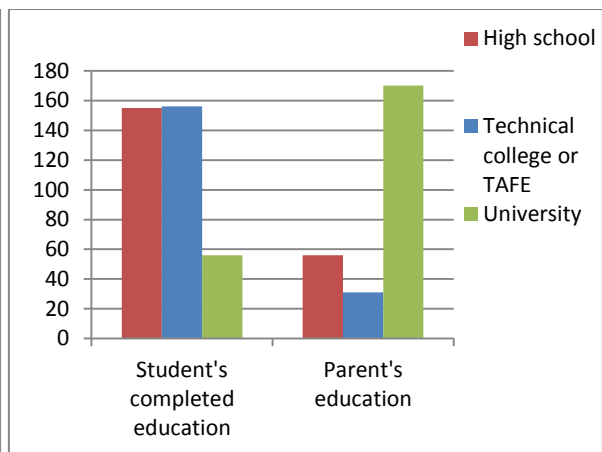
We collected post-code data for all respondents, so that we could compare their location and socioeconomic status (Fig. 4). Across all the modes of study, 93% of respondents resided in Australia while studying online, and 59% are currently living in a metropolitan area. In comparison, only 41% of respondents reported living in the metropolitan area while in primary school.

Regional students made up 19.2% of all respondents, while 2.4% are remote. The national share for regional and remote students in undergraduate higher education in 2013 was 19% and 0.9% respectively (Koshy & Seymour, 2014, p. 12). Parity of representation for regional and remote students was 23.32% and 0.6% in 2011 (DIISRTE 2011, ctd. in Gale & Parker, 2013, p. 19).

Mapping this post-code data to socioeconomic status based on the Western Australian population, 23% of respondents currently have a high SES, 49% a medium SES, 28% have a low SES. This is significant, as the national equity share for undergraduate higher education students from low SES backgrounds in 2013 was just 17.6%, and parity is 25% (Koshy & Seymour, 2014, p. 12).



**Figure 4. Residential area based on post code in primary school and currently.**



**Figure 5. Completed education of students and parents.**

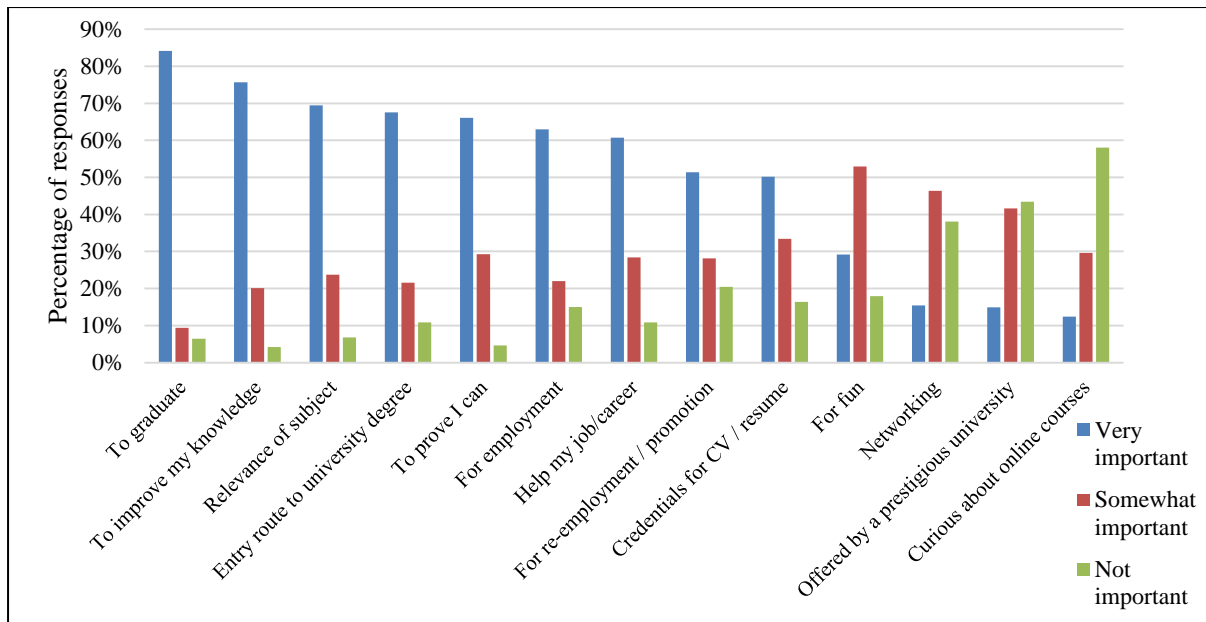
The data suggests that there may be a trend within this cohort in gaining vocational education and training (VET) qualifications as a pathway to university; 27% have a qualification from a technical college or TAFE (Fig. 5). This is high compared to the reports of their parents' technical college or TAFE education (5.4%), although it may be that students are unaware of their parents' full education history. This is something we hope to investigate further in follow-up interviews.

We mapped students' age and gender to their responses to questions about grit, based on Duckworth et al. (2007). The Pearson correlation coefficient indicated there was no correlation between gender and grit. However, unlike Duckworth et al.'s study, which showed grit scores increased with age, students taking our survey showed a negative correlation between age and an individual's grit ( $r=-.22$ ,  $p<.001$ ) – their responses indicated less consistency of interest and less persistence of effort with age.

The reasons for this difference are not yet clear; Duckworth et al. point out that their focus on high-IQ individuals in all six of their studies limited the external validity of their findings, but also speculate that the trend may be generational rather than common across all age groups (p. 1099). The online cohort we have surveyed has a different demographic composition, and notably many are returning to study as mature-age students. This suggests they might be self-selected for low educational grit.

To find out more about what motivated online students, we asked respondents to indicate how important thirteen potential reasons were in motivating them to study online, using a simple three-level Likert scale ("not important", "somewhat important", "very important"), as can be seen in Figure 6.

These motivators can be grouped into two broad factors – necessity and passion. The motivators of necessity were three of the four most commonly chosen motivators ("To graduate," "Relevance of subject," "Entry route to university degree"). Five of the motivators linked to passion were still considered very important or somewhat important by more than half of the cohort ("To improve my knowledge," "To prove I can," "For fun," "Networking," "Offered by a prestigious university"). The three motivators most commonly considered not important were all motivators of passion ("Networking," "Offered by a prestigious university," "Curious about online courses").



**Figure 6. Quantitative factors in motivating students to study.**

The Pearson correlation coefficient was calculated to assess the relationship between grit and these thirteen motivational factors, using Duckworth et al.’s (2007) grit measure. None of the motivators had a significant positive correlation with grit. However, five of these motivators are negatively correlated with a student’s grit score. In other words, students are more likely to have lower perseverance of effort and consistency of interest, if their motivation to study is: to improve their knowledge of the subject ( $r=-.12$ ,  $p=.005$ ), if it is a relevant subject to their academic field of study ( $r=-.07$ ,  $p=.089$ ), proving to themselves that they can do it ( $r=-.08$ ,  $p=.080$ ), a chance to network with other people in the field ( $r=-.07$ ,  $p=.098$ ), and if the course is offered by a prestigious university ( $r=-.08$ ,  $p=.070$ ).

Of particular interest is that three of the motivators most commonly given (“To improve my knowledge,” “Relevance of subject,” “To prove I can”) negatively correlate to a student’s grit score, meaning students with these common motivators are less likely to complete – a cohort potentially experiencing negative attrition as described by Hodges et al. (2013).

We then modelled grit against two broad motivational factors – necessity or passion – and found that if the motivation for studying stems from necessity it will have significant positive correlation to the grit score of individual male students, but not for female students.

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr >  t
Intercept	1	2.37351	0.23747	9.99	<.0001
mov_passion	1	-0.04190	0.09762	-0.43	0.6682
mov_necessity	1	0.13128	0.06976	1.88	0.0611

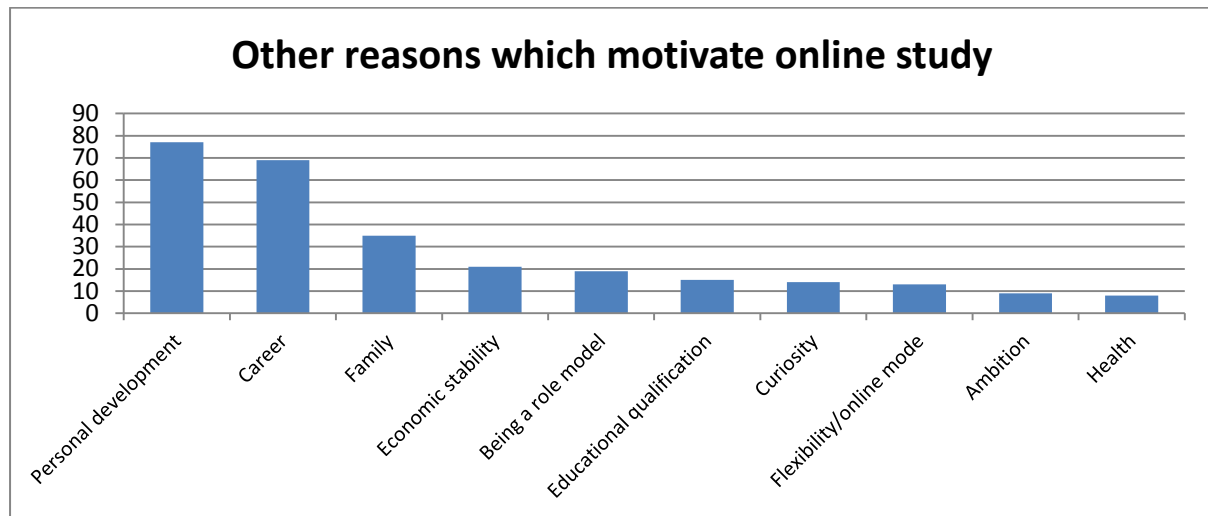
**Table 3. Model of grit as a dependent variable, explanatory variables of passion and necessity, when male.**

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr >  t
Intercept	1	3.33080	0.23435	14.21	<.0001
mov_passion	1	-0.11523	0.08557	-1.35	0.1791
mov_necessity	1	-0.17610	0.08169	-2.16	0.0319

**Table 4. Model of grit as a dependent variable, explanatory variables of passion and necessity, when not a mature age student (under 25).**

In terms of age, if the motivation for studying stems from necessity it will have a negative correlation to their grit score in students below 25 years of age.

In other words, male students are more likely to show perseverance of effort and consistency of interest if their motivation stems from necessity, while those under 25 are less likely to show perseverance of effort and consistency of interest if their motivation stems from necessity.



**Figure 7. Additional reasons that motivate students to study online.**

We gave students the opportunity to explain any other factors which were important in motivating them in an open-response question (Fig. 7). A notable trend in the responses was that family was a motivator:

“So my Mum can be proud of me.”

“To make a better life for my children and teach them that education and a good career is extremely important in life.”

“I have two sons and I would like to set a good example for them.”

“i am a mother of three with an autistic child. I works at Mcdonalds for a living and i am still unable to pay for the therapy my son requires. I am doing this so that i can not only afford to pay for my sons therapy, but as i am studying Laboratory Medicine, i am hoping i can use this to help other autistic children as well.”

Further, family was also correlated to a student’s grit. The Pearson correlation coefficient was calculated to assess the relationship between grit and parents’ education, and whether the student was first in family to attend university. Parents’ education level is positively correlated with student grit ( $r=.08$ ,  $p=.070$ ). Similarly, the results indicate that if an individual is not the first one in their family who goes to university they are likely to have a higher grit score ( $r=.12$ ,  $p=.006$ ).

This is particularly interesting in light of Gemici et al.’s (2014) finding that parental influence is an important factor in driving educational aspiration in young people who are transitioning from secondary school to higher education. It may be that familial influence is also an important driver in mature age education, and whole-of-life learning. It also has implications for second-generation participation in higher education, with these current online students actively encouraging their own children to aspire to university.



## Conclusions

The cohort of online students who responded to the survey have a profile consistent with the idea that online education is being used as a gateway for disadvantaged students who could not otherwise attend university. The majority were mature-aged women, nearly half were the first in their family to attend university, more than one quarter were from low SES backgrounds, and almost a quarter from regional or remote areas.

These demographics have some strong similarities to those reported by Hodges et al. (2013, p. 5) for enabling programs in Australia, which supports the idea that online courses are fulfilling a similar role in offering low-barrier access to higher education for disadvantaged students.

The underlying problems identified by Hodges et al. (2013, p. 6) which lead to attrition for such students are:

the student's experience of time pressures, a complex phenomenon with a multiplicity of underlying causes; life events impacting negatively on the capacity of students to cope (especially for the mature age students who provide the bulk of students in these programs); a low rate of awareness and use of student support services; and low student engagement with the program and fellow students.

Similar problems have been reported in the literature about online higher education, along with factors such as the digital divide, less support for students from teachers, little accommodation for disadvantaged students, and social isolation (Jaggars, 2014).

These complex problems mean that online students require either more grit (perseverance of effort and consistency of interest) to succeed in higher education, or better institutional support, or ideally, both. Our preliminary examination of data from the online students who took our survey shows a pattern emerging of negative grit scores which are correlated both to key demographic factors such as age, and to students' motivations for studying online, with the exception of those with a family history of higher education.

Grit can be learned (Shechtman et al. 2013). Institutions have a place in developing grit, by helping online students link their educational engagement and perseverance to long-term goals rather than short-term motivators, especially for students who have no family history of higher education.

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