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Comparison of workload and academic performances of transfer and native students in an Asian educational context

Post-secondary admission and community college (CC) transfer are two common routes of entry to baccalaureate study. Previous studies comparing the academic performances of native and transfer students have generated inconsistent findings, and furthermore they were largely conducted in Western educational contexts. This study compared the workloads, grade point averages (GPA) and attrition rates of native and transfer students in an Asian educational context. Various measures related to GPA, credit load and attrition rate were collected from the institutional dataset of a Hong Kong university in 2019; this dataset contained records of 14,141 native students and 7,308 transfer students enrolled between 2012 and 2018. Results show that the transfer students experienced transfer shock and had heavier study loads but lighter non-academic loads than the native students. Despite the transfer shock, they attained a higher award GPA and had a lower attrition rate than their native counterparts. Discussion and implications are presented, in relation to transfer shock and transfer student success. In particular, this paper argues that CC education does not necessarily produce academically inferior degree-seeking students and that CC transfer is a viable pathway to baccalaureate study.

Keywords: community college transfer; transfer students; academic performance; GPA; attrition rate

Introduction

For degree-seekers under the massification of higher education, two common routes of entry to university studies are via direct post-secondary admission or through community college transfer (CCT), leading to the differentiation between native students (hereinafter NS) and transfer students (hereinafter TS) (Archambault, 2014). In this study, NS refer to those admitted to baccalaureate degree studies directly after graduating from secondary education, whereas TS are those articulating from community colleges. In our ongoing review, we found only about 30 studies that compared the two groups. Most of these were conducted in Western cultures, particularly in the U.S., and little research has been done

in Asian educational contexts. Thus far, being an objective and easily accessible indicator of student success (LaForge & Hodge, 2011), academic performance has been the most frequently used measure in the field (Glass Jr & Harrington, 2002; Laband et al., 1997; Maino, 2015; Stewart & Martinello, 2012; Palmer, 2011; Xu et al., 2018). A review showed that the grade point average (GPA) of TS are either comparable or better than their native counterparts, even though the findings have not always been consistent (Palmer, 2011). Other comparative studies have argued that the transfer pathway is "insufficiently structured and supported", owing to the lack of agreements on credit transfer and articulation between community colleges and universities (Xu et al., 2016: p. 37). This undesirable observation could be the evidence from TS' heavy study loads brought about by the inadequate recognition of prior learning from community colleges (CCs) (Mehr & Daltry, 2016), lack of time to participate in extra-curricular activities, and receiving less resources and support from universities (Wang & Wharton, 2010). As a result, TS tend to have higher attrition rates than NS (Aulck & West, 2017). On the other hand, NS pursuing the straightforward pathway to four-year baccalaureate degree studies are often the beneficiaries of the "one-size-fits-all" policies and practices in universities (Tobolowsky & Cox, 2012).

As mentioned, existing studies were mainly conducted in Western contexts. The transfer pathway, however, also occurs in Asian countries such as China, Malaysia, Thailand and Vietnam (Farnsworth & Cissel, 2006). Western TS are demographically more diverse than those in Asia (Maino, 2015), which makes the case of TS in an Asian educational context an essential research direction. To contribute to the literature on academic performances of TS in Asia, and to fill the research gap of inconsistent findings, this study explored and compared the workloads and academic performances of TS and

NS in the Asian educational context. Specifically, this study addressed four research questions:

RQ1: Do TS and NS in an Asian educational context have different workloads?

RQ2: Do TS in an Asian educational context experience transfer shock?

RQ3: Do TS and NS in an Asian educational context have different GPAs?

RQ4: Do TS and NS in an Asian educational context have different attrition rates?

Theoretical Framework

This study was guided by a synthesis of various theories and concepts related to students' workloads and academic performances, including transfer student capital (Laanan et al., 2010), the model of student attrition (Tinto, 1975), the longitudinal process of degree completion (Cabrera et al., 2005), and transfer student success (Fauria & Fuller, 2015). The concept of transfer student capital refers to the experiences and academic performance of TS brought from the community college to the university (Laanan et al., 2010). This concept focuses on the importance of students "setting transfer-related academic goals" and the university providing timely, accurate and appropriate academic support services to TS (Rosenberg, 2016). Baccalaureate degree completion, for both NS and TS, is described as a longitudinal process spanning students' college-related decision-making, experiences and outcomes (Cabrera et al., 2005). In particular, college decision making involves students' pre-university academic preparation and their aspirations (Adelman, 1999). College experience entails both academic and social involvement (Wang & Wharton, 2010), and academic performance (e.g., GPA, persistence, etc.). Related closely to student persistence, Tinto's model of student attrition (1975), often applied to studies of TS, states that students' successful academic and social integration into university leads to a higher level of commitment to university study and thereby a

lower likelihood of attrition (Carter et al., 2006). Academic integration is often determined by the students' level of workload and their academic performance (Nevill & Rhodes, 2004). Transfer student success specifies that GPA, as a pivotal measure of academic performance, is one of the indicators of student success (Fauria & Fuller, 2015).

Related Work

Academic performance of transfer students

Student success in higher education has been studied through measuring GPA (Day et al., 2018), persistence (Ajjawi et al., 2019), retention (Naylor & Mifsud, 2019), and dropout rates (Danaher et al., 2008). Among the various measures, GPA and attrition rates have been exploited widely due to their universally agreed objectivity and their accessibility from institutional data (Aulck & West, 2017; LaForge & Hodge, 2011). A common phenomenon named "transfer shock" (Hills, 1965) describes a post-transfer drop in TS' GPAs during their first semester of university, resulting in lower performances than NS (Palmer, 2011). Transfer shock has been attributed to demographic factors (e.g., students' socio-economic status) (Eggleston & Laanan, 2001), academic under-preparation or inferiority (Xu et al., 2018), psychological challenges (e.g., poor self-concept) (Mehr & Daltry, 2016), stress, and anxiety (Chin-Newman & Shaw, 2013). Transfer shock is also shown to increase the risk of attrition in TS (Glass & Harrington, 2002).

On the other hand, some other studies have found that TS either did not show evidence of any transfer shock, or even showed "transfer ecstasy" which refers to post-transfer improvement in academic performance (Aulck & West, 2017). This phenomenon serves to counter the argument that TS are academically under-prepared when compared to their native counterparts (Rhine et al., 2000). Another common indicator of meso-level academic performance is the attrition rate of a student population (Rienks & Taylor,

2009). Attrition is defined by Tinto (1987) as the withdrawal of students from an academic institution before the completion of their baccalaureate degree study. Both GPA and attrition rate should be considered when exploring the academic performances of baccalaureate degree-seeking students (Melguizo et al., 2011).

Academic performance of native and transfer students

There is a host of studies comparing the academic performances of NS and TS in universities. In earlier investigations, it was shown that NS achieved better GPAs than TS (Porter, 1999;). From the beginning of this millennium, research findings have shown a gradual shift, with TS being either comparable to (Carlan & Byxbe, 2000) or even outperforming NS academically (Glass Jr & Harrington, 2002; Xu et al., 2018). With regard to completion of study, there has also been a lack of consensus on which group of students is more likely to graduate. Some studies have identified that TS had higher attrition rates than NS (e.g., Porter, 1999) while others have found the reverse (e.g., Drewes et al., 2012), and some have found no significant differences between them (e.g., Lee et al., 1993). In the literature, NS outscoring TS is often attributed to transfer shock (Rhine et al., 2000), their lack of academic rigor in their prior study in CCs (Carlan & Byxbe, 2000), and personal factors (e.g., family obligations during study) (Maino, 2015). On the other hand, TS success, arising from their outperforming their native counterparts, is sometimes attributed to the retention of the strongest CC graduates (who successfully transferred to universities) (Laband et al., 1997) and the academic backgrounds they acquired in their CCs (Maino, 2015).

To the best of the authors' understanding, existing studies on the academic performances of TS were conducted in Western countries, predominately in the U.S. Much less research attention has been diverted to community college transfer in the Asian educational contexts (Farnsworth & Cissel, 2006), particularly in the research direction of comparing

the academic performances between NS and TS. This study aims to fill the research and knowledge gaps.

Research Context

Pathways to university studies in Hong Kong

As part of a cross-institution project on enhancing the learning experience of TS, this study was conducted in a comprehensive university in Hong Kong (HK). Starting from 2012, secondary school leavers sit for a public examination named the HK Diploma of Secondary Education (HKDSE). This is recognized internationally and benchmarked to the General Certificate of Education Advanced Level (GCE A Level) examination from the U.K. Through the Joint University Programmes Admissions System (JUPAS), those who have fulfilled the minimum requirements in their HKDSE results can be admitted directly to the degree programmes offered by the eight local public universities, as first-year freshman entrants (i.e., NS) to complete their undergraduate studies within the duration of four years.

Those who fail to fulfil these requirements can opt to enroll in CCs, to pursue sub-degree studies. For the purposes of providing an "alternative route to higher education" and more learning opportunities for "acquiring skills and qualifications" to enhance employability, the American CC model was pioneered in HK in 2000, with existing universities and new tertiary institutions starting to offer sub-degree programmes (Lee, 2014: p. 608). Those who have obtained an associate degree or a higher diploma with a competitive GPA are qualified to articulate to the degree programmes offered by the eight public universities. These TS are to complete their undergraduate studies in two years, somewhat similar but not equivalent to the junior and senior years of NS. In HK, a quota is assigned to public universities to accommodate these CC TS. The university in which

this study was conducted contains the largest proportion of TS of all the eight public universities.

Credit structure: academic and non-academic loads

In the university where this study was conducted, there are three major blocks of credits for completion of an undergraduate program ([redacted for double-blind review], 2020). The first block represents the general university requirements. For instance, they are required to take a service-learning subject for serving to the community. The second block is for discipline-specific (i.e., for "Major") requirements. Besides the subjects taken in the classroom, the students are also required to take part in a work-integrated-education experience by working full-time or part-time or having clinical placements for a given number of hours in a working environment (e.g., a company, hospital). The third and last blocks house the free credits dedicated to the study of a minor subject and free electives.

Research Design and Methodology

Research Design

To compare academic performances of NS and TS, this study adopted both quantitative and comparative research methodologies. Workload was measured by the numbers of academic and non-academic credits. Academic performance was measured quantitatively by students' various GPA-related variables and their attrition rates. A descriptive comparative research design serves to describe differences between groups in a population without any manipulation (Cantrell, 2011; Pallant, 2007). It was appropriate for the present study as both groups of students were undergraduates, even though from different routes of entry.

Data Collection and Analysis

Ethical approval (HSEARS20180104005-02) was granted by the Data Access Committee. As requested by the researchers of this study, institution-wide individual-level data that had been de-identified and pseudonymized, including students' demographic information, credit loads, and their academic performances, were obtained from the university's Academic Registry in 2019. Both the Committee and Registry were aware of the purpose of the data collection. The process of requesting approval and gathering data took about eight months. There was a total of 27,293 valid student records in the dataset. The student population with data that were relevant was restricted to all local full-time NS (N = 14,141) and TS (N = 7,308) who had been enrolled in the university between 2012 and 2018. It should be noted here that in 2012, universities in HK were converted from "three-year institutions" to "four-year institutions" following a major curriculum reform, through which the duration of undergraduate study was changed from three to four years (Evans, 2018). Non-local students and students who were not admitted through local post-secondary admission or CC transfer were excluded from this study.

To answer the research questions, various measures of workload and academic performance were collected and analyzed, including the total number of academic and non-academic credits per year of study, number of subjects per semester, GPAs in various semesters, award GPAs attained in sub-degree and baccalaureate studies, average subject grade points, percentages of students on academic probation, and attrition rates. Award GPA is the final GPA value awarded to a student for his/her graduation, where both the pre-transfer and post-transfer award GPAs were scaled to a maximum of 4.0. The average subject grade points were calculated for the purpose of this study according to the

university's grade conversion scale[1]. The award GPA takes into consideration the credit values of subjects (e.g., higher for a major subject) in that weights are applied to calculating the subject grade points. In this study, the subject grade points were not affected by these weightings. Academic probation is a prior warning given to a student who attains a cumulative GPA below 2.0 for a semester. Those on academic probation are required to retake subjects in order to attain the minimum required GPA, or will otherwise be de-registered from the university. The institutional dataset did not provide the direct information as to which students had been withdrawn from their studies (i.e., attrition). Therefore, this study considered a student to have dropped out if his/her year of study was shorter than the normal duration required by his/her programme and if he/she did not have an award GPA.

To investigate any presence of transfer shock, paired-samples t-tests were used to compare the TS' GPAs across semesters. Independent-samples t-tests were employed to compare the continuous data (i.e., GPA, credits) between the two groups and chi-square tests of independence were used to compare proportions and percentages (e.g., attrition rate). The level of statistical significance was determined at $p < 0.05$. The statistical analyses were performed using SAS Version 9.4 for the Windows platform (SAS Institute Inc., Cary, NC, USA).

Results

Student demographics

Table 1 shows the demographic information for the target student population. NS and TS contributed respectively to 51.8% and 26.8% of the entire student population of the

[1] A+ = 4.5, A = 4.0, B+ = 3.5, B = 3.0, C+ = 2.5, C = 2.0, D+ = 1.5, D = 1.0, F = 0.

university. For every 1.94 NS, there was one TS. 52.8% of the NS and 52.3% of the TS were female. The female-to-male ratios were statistically not different for both groups ($p = 0.528$). The average age of TS on admission to the university (20.93 years) was significantly higher than that of the NS (18.41 years) ($p < .0001$). Overall, the demographics of the target student population were comparable to that of the entire student population.

[Table 1 here]

Academic and non-academic loads

The number of credits received by students is often used as an indicator of their workload in the university (Pogacnik et al., 2004). As shown in the statistics in Table 2, the average number of credits taken by the TS per year of study (34.8) was significantly higher than that of the NS (32.1) ($p < .0001$). In particular, the TS' average number of academic credits per year (33.0) also outweighed that of the NS (29.6) ($p < .0001$). On the contrary, the NS' average number of non-academic credits per year (2.98) was significantly higher than the TS' (2.8) ($p < .0001$). On another note, the average number of subjects taken by TS per semester was significantly higher than that of the NS, in each semester.

[Table 2 here]

GPA

As suggested in the literature (Xu et al., 2016), before comparing the academic performances of the two groups, the progression of students' academic performances across semesters within each group were explored. Table 3 shows the GPA statistics for each semester for both groups of students and Table 4 shows the GPA progressions throughout the semesters. The results of within-group paired-samples t-tests showed that the TS' GPAs had a statistically significant drop by 0.34 points from 3.39 in CCs to 3.05

in their first semester in university ($p < .0001$). This indicates the "transfer shock" phenomenon (Hills, 1965). In the first year of baccalaureate study, the TS' GPAs dropped by 0.04 from 3.05 in their first semester to 3.01 in their second semester ($p < .0001$), then rose by 0.11 to 3.12 in the first semester of the second year ($p < .0001$) and rose further by 0.02 to 3.14 in the second semester ($p < .0001$). This progression can be seen as starting with the transfer shock in their first year, followed by a recovery in the second year.

[Table 3 here]

[Table 4 here]

Since both groups of students had different durations of baccalaureate study (i.e., 4 vs. 2 years), only their award GPAs were compared. Table 5 displays the comparative statistics for the GPA-related measures. Both the TS' average award GPA (3.16) and their average subject grade points (3.06) outperformed those of the NS (3.11; 2.99) ($p < .0001$). The proportion of TS on academic probation (2.1%) was significantly lower than that of NS (7.2%) ($p < .0001$).

[Table 5 here]

Attrition rates

From the institutional dataset with student records from 2012 to 2018, 5828 NS and 4504 TS graduated between the academic years 2015/16 and 2018/19. 429 NS (6.9%) and 140 TS (3.3%) were found to have dropped out. A chi-square test of independence yielded that the attrition rate of NS was significantly larger than that of TS ($p < .0001$).

Discussion and Implications

To our best knowledge, this is the first study to compare NS and TS in terms of their study load and academic performances in an Asian educational context. In terms of workload

(RQ1), results showed that TS received a higher number of both total and academic credits per year. As indicated by GPA, the TS experienced transfer shock in their first two semesters of their first year, but recovered from it in their second year (RQ2), whereas the NS experienced GPA fluctuations throughout the several semesters of their first and second years. Comparing the two groups academically (RQ3), the TS had a significantly higher average award GPA and average subject grade points than the NS. Compared to the NS, there was a smaller proportion of TS on academic probation and a lower attrition rate was observed for them.

Transfer shock

We found that TS experienced a transfer shock, which is consistent with findings from a recent study (Xu et al., 2018). Specifically, a typical Western TS experiences a drop of 0.30 GPA points in the first post-transfer semester (Xu et al., 2016). This implies that the extent of transfer shock is similar in the Western and Asian educational contexts. This commonly observed significant decline in post-transfer GPA can be explained by the so-called inflated grading practices and lowered expectations in pre-transfer studies in CCs (Behnke, 2018). It is noteworthy that the majority of existing studies of TS were conducted in Western contexts and involved demographically diverse student populations, whereas vertical TS in HK are largely fresh graduates from CCs (Lee, 2014). In particular, TS in Western contexts (e.g., U.S.) tend to have family and financial obligations, with full-time working experience prior to entering university (Maino, 2015), while those in HK seem more likely to be fresh holders of an associate degree or higher diploma articulating directly to university and have fewer commitments (Lee, 2014). The demographic data from this study also support this observation, since these HK TS (mean age = 20.93) were about two years older than their native counterparts (18.41), and both

groups were full-time students. Our results regarding GPA imply that transfer shock occurs regardless of the TS' personal backgrounds.

In addition, this transfer shock can be attributed to the commonly seen obstacle of adjusting to the new academic environment of university (Melguizo et al., 2011; Wang & Wharton, 2010). Our results also corroborate previous studies, in that TS recover from transfer shock in subsequent semesters (Stewart & Martinello, 2012). Although the TS were able to recover from transfer shock at a later timepoint in their studies, their eventual average award GPA in university (3.16) was still much lower than that previously attained in CCs (3.39; $p < .0001$). To alleviate transfer shock, we suggest not only should universities cater counselling, tutoring and mentoring services to TS (Glass Jr & Harrington, 2002) but they should also arouse the students' awareness of these resources and support services (Rhine et al., 2010). Additional resources should be allocated, at least throughout TS' first year of university study (Stewart & Martinello, 2012). For CC transfer in HK or the broader Asian educational context, sub-degree holders are more likely to articulate directly into university without any "gap years" (Heath, 2007), but, according to the results of this study, they are still likely to experience transfer shock, with a comparable extent as those in the West. It is therefore even more likely that TS in Western countries will be affected by this post-transfer issue, as they are more likely to have been away from the academic environment (e.g., in workplace) for a number of years before returning to baccalaureate study (Maino, 2015). This reinforces the importance of having the aforementioned resources and support for TS.

Transfer student success

Even though the students in this study experienced transfer shock during their first two semesters in university, their average award GPA still outscored the NS. This can be regarded as "transfer student success" favoured by university administration (Fauria &

Fuller, 2015). CCs have been criticized for having a low institutional quality (Kurlaender et al., 2016) owing to the faculty being "excessively nurturing" and inflation in grading practices, thus producing graduates academically under-prepared and with low or diverted educational aspirations (Carlan & Byxbe, 2000). Subsequently, TS are seen as being academically inferior (Xu et al., 2018). This study has shown otherwise, that TS might be more prepared academically than their native counterparts. In fact, when compared to NS coming from secondary schools, these TS are inherently more resilient and motivated, since articulation from CCs to universities places an "extremely high emphasis" on academic performance (Lee, 2014: p. 620; Wang, 2009). The transfer process entails a rigorous and competitive screening mechanism that "retains" the strongest sub-degree holders (Jenkins & Fink, 2016). Moreover, in HK, those unable to matriculate to baccalaureate studies "straight away" after secondary education perceive themselves as "losers" (Wong & Tse, 2017: p. 279). Therefore, CC transfer acts as a "second chance" that might motivate them to attain better academic performance in university (Wong, 2016: p. 256).

Given the shorter duration of baccalaureate study for TS, their academic paths (e.g., choices of majors) tend to be more focused compared to those of NS who can carry out their planning and decision-making throughout their four years of study (Aulck & West, 2017). A more focused academic path can lead to higher motivation for timely graduation (Allen & Robbins, 2010). This also explains why one study identified a smaller proportion of TS were on academic probation, thereby also a lower attrition rate (Abele et al., 2013). Given their prior CC experience and the current level of support provided to TS, their academic performances have already exceeded those of NS. This suffices as empirical evidence that CC education does not necessarily produce academically inferior students (Xu et al., 2018). With more resources and support from

various stakeholders (e.g., student affairs office, academic advisors, counsellors, etc.), CC transfer can be a viable pathway to baccalaureate study.

Although the TS in our study outperformed the NS, they carried heavier academic workloads (c.f. Table 2), demonstrating consistency with previous findings on credit loads (Xu et al., 2016). Although the number of credits students received in their prior CCs was unknown in this study, the data infer that successful transfer were likely to have heavy credit loads in their CC studies. An increased academic involvement of TS is shown to improve their educational experiences as well (Wang, 2009). However, a heavy academic load can still emerge as a challenge to TS in that their mental health could be affected adversely, especially when they are already faced with the undesirable experience of transfer shock (Chin-Newman & Shaw, 2013). For students on the whole, participating in co-curricular and extra-curricular activities will not only enrich their personal development but also reduce their stress levels (Kausar, 2010). For TS, nonetheless, their heavier academic loads might have reduced the time and effort available for non-academic engagement, thus a smaller number of non-academic credits (c.f. Table 2). Our results also indicate that the TS had a heavier study load in the summer semester, which otherwise could have been spent on other experiences such as overseas exchange, campus activities (e.g., orientation camps), internship and other personal pursuits. Previous studies have suggested the importance of both academic and social involvement for TS to integrate into their campus life experience in university (Massi et al., 2012). Our study infers that the academic performance of TS might have been attained at the expense of their non-academic involvement. University administration and faculty should strive to refine or restructure TS' academic and non-academic requirements, so as to allow them to spare time for other activities and commitments. Given the large

proportion of TS in universities, funding bodies could allocate resources targeted at helping this student population.

Considering the student demographics, existing studies have attributed TS success to the maturation factor, in that they are more mature to face post-transfer "physical and emotional changes" (Behnke, 2018: p. 108). Nevertheless, in recent large-scale studies with over 70,000 student records (e.g., Aulck & West, 2017), the age difference between NS and TS is 5.61 years, whereas in this study it was only 2.52 years. TS in Western educational contexts, particularly in the U.S., often finish their CC studies in more than two years, or undertake certain working experience before the transfer process (Maino, 2015). In the meantime, the majority of TS in HK articulate directly from their two years of sub-degree pursuit to baccalaureate studies (Lee, 2014). The age range of TS in this study are in effect comparable to that of third-year (i.e., junior-year) NS. Still, we opted out of comparing TS directly with these third-year students, since this would have presumed that TS' prior two-year experience in CCs is equivalent to the first two years of baccalaureate studies in universities. This presumption has been rendered invalid by critiques of CC education in comparison with four-year institutions (Carlan & Byxbe, 2000; Kurlaender et al., 2016). By the same token, faculty should pay special attention to TS by identifying them among junior-year students. Even if they are academically superior to NS, they still belong to an under-represented group that deserves more support. Given the important role of academic and social integration in students' educational experiences (Wang & Wharton, 2010), even the simple acts of faculty-student interaction can be "educationally purposeful" for helping TS adjust to and benefit from their learning environment (Fauria & Fuller, 2015).

Limitations and Future Work

There are several limitations in this study. First, covariates such as age, gender, non-credit bearing subjects, and major subjects were not taken into consideration. More importantly, students' progress and performance are multi-dimensional and cannot be captured entirely by a few measures such as GPA and attrition rate. Also, while TS success has largely been measured through either objective indicators of academic performance (e.g., GPA, attrition rate) (Fauria & Fuller, 2015) or subjective indicators of the students' perceptions (e.g., satisfaction with university experience) (Moser, 2012), both measures should be considered at the same time in future endeavours. Second, since this study was conducted in the university with the largest number of TS in HK, the interpretation and generalizability of findings should be done with caution. Future work will explore the factors that influence their academic performances.

Conclusion

This study compared the workloads and academic performances of NS and TS in an Asian educational context. The results show that the TS experienced transfer shock and had heavier study loads but lighter non-academic loads than the NS, although they attained a higher average award GPA and had a lower attrition rate than their native counterparts. Our findings do indicate differences between transfer experience in Asian and Western contexts. The results also imply that CC education might not necessarily produce academically inferior degree-seeking students and that CC transfer can serve as a viable pathway to baccalaureate study. Universities should, nonetheless, still provide timely and adequate resources and support to these CC transfer students in both their academic and extra-curricular (e.g., orientation, overseas exchange) integration to baccalaureate study.

References

Abele, C., Penprase, B., & Ternes, R. (2013). A closer look at academic probation and attrition: What courses are predictive of nursing student success?. *Nurse Education Today*, *33*(3), 258-261.

Adelman, C. (1999). *Answers in the tool box: Academic intensity, attendance patterns, and bachelor's degree attainment*. Washington, DC:U.S. Dept. of Education, Office of Educational Research and Improvement; Jessup, Md.: U.S. Dept. of Education, Office of Educational Research and Improvement.

Ajjawi, R., Dracup, M., Zacharias, N., Bennett, S., & Boud, D. (2019). Persisting students' explanations of and emotional responses to academic failure. *Higher Education Research & Development*, *39*(2), 185-199.

Allen, J., & Robbins, S. (2010). Effects of interest–major congruence, motivation, and academic performance on timely degree attainment. *Journal of counseling psychology*, *57*(1), 23-35.

Archambault, K. L. (2014). The typology and needs of American transfer students. *Today's college students: A reader*, 215- 224.

Aulck, L., & West, J. (2017). Attrition and performance of community college transfers. *PloS one*, 12(4).

Behnke, B. M. (2018). *Differences in grade point averages as a function of credit attainment for students at a texas 4-year public university* (Doctoral dissertation, Sam Houston State University). Sam Houston State University Scholarly Works. https://shsu-ir.tdl.org/handle/20.500.11875/2398

Cabrera, A. F., Burkum, K. R., La Nasa, S. M., & Bibo, E. W. (2005). Pathways to a four-year degree. *College student retention: Formula for student success,* 155214.

Cantrell, M. A. (2011). Demystifying the research process: Understanding a descriptive comparative research design. *Pediatric Nursing, 37*(4), 188.

Carlan, P. E., & Byxbe, F. R. (2000). Community colleges under the microscope: An analysis of performance predictors for native and transfer students. *Community College Review*, *28*(2), 27-42.

Carter, D. F. (2006). Key issues in the persistence of underrepresented minority students. *New Directions for Institutional Research, 2006*(130), 33-46.

Chin-Newman, C. S., & Shaw, S. T. (2013). The Anxiety of Change: How New Transfer Students Overcome Challenges. *Journal of College Admission*, (221).

Danaher, P. A., Bowser, D., & Somasundaram, J. (2008). The student departure puzzle: do some faculties and programs have answers?. *Higher Education Research & Development, 27*(3), 271-280.

Day, I. N., van Blankenstein, F. M., Westenberg, P. M., & Admiraal, W. F. (2018). Explaining individual student success using continuous assessment types and student characteristics. *Higher Education Research & Development, 37*(5), 937-951.

Drewes, T., Maki, K., Lew, K., Willson, M., & Stringham, K. (2012). *An analysis of CAAT transfer students' academic performance at Trent University*. A report submitted to the Ontario Council on Articulation and Transfer, Toronto, ON.

Eggleston, L. E., & Laanan, F. S. (2001). Making the transition to the senior institution. *New directions for community colleges*, *2001*(114), 87-97.

Evans, S. (2018). Making the transition to higher education in Hong Kong: a tale of two cohorts. *Journal of further and higher education*, 42(2), 177-192.

Farnsworth, K., & Cissell, A. (2006). Community college development in Asia: The new economic imperative. *International Educator*, 15(4), 60.

Fauria, R. M., & Fuller, M. B. (2015). Transfer Student Success: Educationally Purposeful Activities Predictive of Undergraduate GPA. *Research & Practice in Assessment*, 10, 39-52.

Glass Jr, J. C., & Harrington, A. R. (2002). Academic performance of community college transfer students and" native" students at a large state university. *Community College Journal of Research and Practice*, *26*(5), 415-430.

Heath, S. (2007). Widening the gap: pre-university gap years and the 'economy of experience'. *British journal of sociology of education*, 28(1), 89-103.

Hills, J. R. (1965). Transfer shock: The academic performance of the junior college transfer. *The Journal of Experimental Education*, *33*(3), 201-215.

Jenkins, P. D., & Fink, J. (2016). T*racking transfer: New measures of institutional and state effectiveness in helping community college students attain bachelor's degrees.* Community College Research Center, Teachers College, Columbia University. https://doi.org/10.7916/D8C24W80

Kausar, R. (2010). Perceived Stress, Academic Workloads and Use of Coping Strategies by University Students. *Journal of Behavioural Sciences*, *20*(1), 31-45.

Kurlaender, M., Carrell, S., & Jackson, J. (2016). The promises and pitfalls of measuring community college quality. RSF: The Russell Sage Foundation Journal of the Social Sciences, 2(1), 174-190.

Laanan, F. S., Starobin, S. S., & Eggleston, L. E. (2010). Adjustment of community college students at a four-year university: Role and relevance of transfer student capital for student retention. *Journal of College Student Retention: Research, Theory & Practice,* 12(2), 175-209.

Laband, D. N., Rosenberg, D. L., & Smith, K. J. (1997). An examination of the performance of transfer versus native students in upper-level accounting courses. *Journal of Accounting Education*, *15*(4), 515-529.

LaForge, L., & Hodge, J. (2011). NCAA academic performance metrics: Implications for institutional policy and practice. *The Journal of Higher Education*, *82*(2), 217-235.

Lee, V. E., Mackie-Lewis, C., & Marks, H. M. (1993). Persistence to the baccalaureate degree for students who transfer from community college. *American Journal of Education*, 102(1), 80-114.

Lee, W. W. (2014). Opening up a road to somewhere: Development of associate degree students in Hong Kong. *International Journal of Lifelong Education*, 33(5), 607-624.

Maino, A. A. (2015). *A Comparison of Academic Performance Between Community College Transfer Students and Non-transfer Students at a Four-year University in Ecuador* (Doctoral dissertation, University of Miami). *University of Miami Scholarly Repository. http://scholarlyrepository.miami.edu/cgi/viewcontent.cgi?article=2519&context=oa_dissertations*

Massi, L., Lancey, P., Nair, U., Straney, R., Georgiopoulos, M., & Young, C. (2012). Engineering and computer science community college transfers and native freshmen students: Relationships among participation in extra-curricular and co-curricular activities, connecting to the university campus, and academic success. In *2012 Frontiers in Education Conference Proceedings (pp. 1-6)*. Seattle, WA: IEEE. https://doi.org/10.1109/FIE.2012.6462276

Mehr, K. E., & Daltry, R. (2016). Examining mental health differences between transfer and nontransfer university students seeking counseling services. *Journal of College Student Psychotherapy*, *30*(2), 146-155.

Melguizo, T., Kienzl, G., & Alfonso, M. (2011). Comparing the Educational Attainment of Community College Transfer Students and Four-Year College Rising Juniors Using Propensity Score Matching Methods. *The Journal of Higher Education, 82*(3), 265-291.

Moser, K. (2012). *Redefining transfer student success: Transfer capital and the Laanan-transfer students' questionnaire (L-TSQ) revisited* (Doctoral dissertation, Iowa State University). Iowa State University Digital Repository. https://doi.org/10.31274/etd-180810-498

Naylor, R., & Mifsud, N. (2019). Towards a structural inequality framework for student retention and success. Higher Education Research & Development, *39*(2), 259-272.

Nevill, A., & Rhodes, C. (2004). Academic and social integration in higher education: a survey of satisfaction and dissatisfaction within a first-year education studies cohort at a new university. *Journal of Further and Higher Education, 28*(2), 179-193.

Palmer, V. J. (2011). *A comparative study of the academic performance of community college transfer students and native students at selected state universities in North Carolina* (Doctoral dissertation, East Carolina University). East Carolina University's Institutional Repository. http://hdl.handle.net/10342/3634

Pogacnik, M., Juznic, P., Kosorok-Drobnic, M., Pogacnik, A., Cestnik, V., Kogovsek, J. & Fernandes, T. (2004). An attempt to estimate students' workload. *Journal of veterinary medical education*, 31(3), 255-260.

Porter, S. (1999). Assessing Transfer and Native Student Performance at Four-Year Institutions. In Dolores, V. (Eds.) *Air 1999 Annual Forum Paper.* The Thirty-Ninth Annual Forum of the Association for the Institutional Research https://eric.ed.gov/?id=ED433790

Rhine, T. J., Milligan, D. M., & Nelson, L. R. (2000). Alleviating transfer shock: Creating an environment for more successful transfer students. *Community College Journal of Research & Practice*, *24*(6), 443-453.

Rienks, J., & Taylor, S. (2009, June). Attrition and academic performance of students identified as at-risk using administrative data alone. In Thomas, J.(Eds.) *First year in Higher education Conference 2009.* Queensland University of Technology, Brisbane Australia. http://fyhe.com.au/past_papers/papers09/content/pdf/1A.pdf

Rosenberg, M. J. (2016). Understanding the adult transfer student—support, concerns, and transfer student capital. *Community College Journal of Research and Practice*, 40(12), 1058-1073.

Stewart, J., & Martinello, F. (2012). Are Transfer Students Different? An Examination of First-Year Grades and Course Withdrawals. *The Canadian Journal of Higher Education*, *42*(1), 25-42.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of educational research, 45*(1), 89-125.

Tinto, V. (1987). Leaving college: *Rethinking the causes and cures of student attrition*. University of Chicago Press, 5801 S. Ellis Avenue, Chicago, IL 60637.

Tobolowsky, B. F., & Cox, B. E. (2012). Rationalizing neglect: An institutional response to transfer students. *The Journal of Higher Education, 83*(3), 389-410.

Wang, X. (2009). Baccalaureate attainment and college persistence of community college transfer students at four-year institutions. *Research in Higher Education*, 50(6), 570-588.

Wang, X., & Wharton, B. (2010). The differential patterns of college involvement between transfer and native students. *Journal of The First-Year Experience & Students in Transition, 22*(1), 49-66.

Wong, Y. L. (2016). Self-explanation, self-evaluation, legitimation of social inequality: the case of community-college students in Hong Kong. *International Journal of Adolescence and Youth, 21*(2), 252-266.

Wong, Y. L., & Tse, W. S. (2017). An illustration of the Operation of Social Legitimation for 'Winners' and 'Losers': A Comparison of Accounts of University and Community–College Students in Hong Kong. *Journal of Adult Development, 24*(4), 277-286.

Xu, D., Jaggars, S. S., Fletcher, J., & Fink, J. E. (2018). Are community college transfer students "a good bet" for 4-year admissions? Comparing academic and labor-market outcomes between transfer and native 4-year college students. *The Journal of Higher Education*, *89*(4), 478-502.

Xu, D., Jaggars, S., & Fletcher, J. (2016). *How and why does two-year college entry influence baccalaureate aspirants' academic and labor market outcomes?*. Community College Research Center, Teachers College, Columbia University. https://doi.org/10.7916/D8WH2Q4H

Table 1. Demographic information of student population

Gender	**Native students**	**Transfer students**	**All students**
	N (% to total)		
Female	7463 (52.8%)	3805 (52.1%)	14175 (52.0%)
Male	6678 (47.2%)	3503 (47.9%)	13118 (48.0%)
Age at entry			
Min	16	19	14
Max	36	51	51
Mean	18.41±0.86	20.93±1.41	19.30±1.64

Table 2. Statistics for academic and non-academic loads in the university

Measures of workload		**Native students**	**Transfer students**	**Sig. t-test**
No. of credits per year	**Min**	29.5	30.0	$p < .0001$
	Max	39.5	55.5	
	Mean ± SD	32.1±1.4	34.8±3.2	
No. of academic credits per year	**Min**	23.2	27.5	$p < .0001$
	Max	34.8	50.0	
	Mean ± SD	29.6±2.5	33.0±2.4	
No. of non-academic credits per year	**Min**	0.3	0.5	$p < .0001$
	Max	8.3	11.7	
	Mean ± SD	2.98±2.35	2.64±2.17	
No. of subjects taken per normal semester	**Min**	2.5	2.6	$p = .007$
	Max	9	8	
	Mean ± SD	5.66±0.57	5.69±0.73	
No. of subjects taken per summer semester	**Min**	1	1	$p < .0001$
	Max	4	5	
	Mean ± SD	1.39±0.49	1.48±0.64	

Table 3. Statistics for GPA by semester

Timepoint	**Native**		**Transfer**	
	Range	**Mean ± SD**	**Range**	**Mean ± SD**
Sub-degree	NA		1.83 – 4.00	3.39 ± 0.27
Y1S1	0.20 - 4.00	2.92 ± 0.50	0.33 – 4.00	3.05 ± 0.46
Y1S2	0.17 - 4.00	2.91 ± 0.52	0.21 – 4.00	3.01 ± 0.47
Y2S1	0.17 – 4.00	2.89 ± 0.60	0.66 – 4.00	3.12 ± 0.46
Y2S2	0.16 – 4.00	2.93 ± 0.56	0.20 – 4.00	3.14 ± 0.46
Y3S1	0.25 – 4.00	3.02 ± 0.55		
Y3S2	0.14 – 4.00	3.04 ± 0.53		
Y4S1	0.22 – 4.00	3.19 ± 0.50		
Y4S2	0.40 – 4.00	3.23 ± 0.48		

Table 4. Statistics for GPA progression

Progression	**Native**		**Transfer**	
	Change	Sig.	Change	Sig.
Sub-degree → Y1S1	NA		-0.34	$p < .0001$
Y1S1 → Y1S2	-0.01	$p = .004$	-0.04	$p < .0001$
Y1S2 → Y2S1	-0.02	$p < .0001$	+0.11	$p < .0001$
Y2S1 → Y2S2	+0.04	$p < .0001$	+0.02	$p < .0001$
Y2S2 → Y3S1	+0.03	$p < .0001$		
Y3S1 → Y3S2	+0.02	$p < .0001$		
Y3S2 → Y4S1	+0.15	$p < .0001$		
Y4S1 → Y4S2	+0.04	$p < .0001$		

Table 5. Statistics for GPA-related measures of academic performances

Measures of academic performances		**Native students**	**Transfer students**	**Sig. t-test**
Award GPA	**Min**	2.11	2.02	$p < .0001$
	Max	4.00	4.00	
	Mean ± SD	3.11 ± 0.33	3.16 ± 0.32	
Average subject grade points	**Min**	0	0	$p < .0001$
	Max	4.50	4.50	
	Mean ± SD	2.99 ± 0.80	3.06 ± 0.71	
		Native students	**Transfer students**	**Sig. Chi-square**
Academic probation	**N**	1002	288	$p < .0001$
	% to total	6.9%	3.3%	