

Synthesis and Model Development of Thai Undergraduate Dropout Risk Factors

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Abstract

This study synthesizes existing research to explore factors affecting student attrition in Thai higher education institutions and develop a causal model for dropout risk. The synthesis uses a mixed-method approach following PRISMA 2020 guidelines, drawing on six years of Thai contextual studies on student attrition, academic intention, commitment, and persistence. Through a systematic review of multiple databases, 21 quantitative or mixed-method studies were identified for inclusion, which yielded 107 items representing 186 occurrences related to student dropout or persistence factors in Thai higher education. These items were grouped into nine clusters: academic integration, attitudinal and behavioral factors, classroom and institutional environment, emotional distress, family support, financial considerations, institutional support, social integration, and student satisfaction. The model synthesizes research findings on student attrition in Thai universities, providing a comprehensive framework for understanding the factors influencing students' persistence and dropout risk. By considering the interplay between these factors, the model aids in developing targeted interventions and informed policy decisions that promote academic success and ensure the long-term efficacy of Thai higher education institutions. The model's application can potentially guide researchers, educators, and policymakers in addressing the challenges students face within the Thai higher education system, ultimately fostering a more supportive and conducive environment for academic achievement.

Keywords: academic integration, academic persistence, attrition, student retention, Thai higher education, undergraduate, withdrawal

1. Introduction

Thai higher education institutions (HEIs) face considerable challenges in an increasingly saturated and competitive education sector. A rapidly aging society and a diminishing student population have compelled numerous HEIs to reconceptualize their institutional designs to accommodate declining domestic enrollment, elevated academic withdrawal rates, and escalating operational costs. In conjunction with intensified international competition, the consequent excessive supply within the Thai higher education sector has driven HEIs to adopt a marketized paradigm, vying for a limited pool of individuals who function primarily as consumers rather than traditional students (Scott & Guan, 2022). Institutions must reduce the tuition revenue per student while increasing the marketing costs per student. Cost-cutting strategies to maintain institutional financial viability have reduced program quality (Fry & Bi, 2013) and undermined student academic and social integration (Tangcharoen, Naiyapatana, & Tungprapa, 2019). As students fail to establish a solid institutional identity, the value of their educational experience deteriorates, prompting them to reevaluate their institutional choice or commitment to continue (Kerby, 2015).

Student dropout rates through institutional transfer or voluntary withdrawal represent a loss of investment for both the institution and the student. Such shortfalls subsequently impact existing student services and program quality (Scott & Guan, 2022b), engendering negative factors that could provoke further student attrition and exacerbate institutional economic strain (Rujichinnawong, 2018). Thai universities face challenges specific to their context, which differ from those encountered by institutions in Western countries. Distinctive local and regional sociocultural factors, government policies, and interventions give rise to issues unique to Thailand. A comprehensive examination of current conditions to identify the predominant factors contributing to student withdrawal in Thai HEIs, the relationship between each factor, and the increased student dropout risk is essential

for developing an efficient, targeted approach to enhance student persistence.

1.1 Problem Statement

Thai universities face a mass organizational existential crisis, a complex and uncertain future with large-scale student-age population contractions that have led to systemic financial instability. As Thai universities are financially dependent on tuition revenue, maximizing student enrollment and academic persistence are necessary for operational success. Student dropouts strain the beleaguered system, as the institutions waste resources in the recruitment process and lose the future revenue of other potential applicants. The data from Thailand reveals a dropout probability among undergraduate students ranging from 23% to 26%. (Compan & Apibunyopas, 2019; Sosu & Pheunpha, 2019; Thongkon, 2013). However, significant variations exist between institutions' average dropout rates and those specific to individual departments. Identifying the factors that increase the risk of student dropout will allow for effective internal policies that will better support students improve institutional stability, and the overall quality of service. Developing a large-scale multidimensional model targeting all universities in Thailand will allow for a more methodical understanding of current perceived conditions and factors leading to dropout risk.

2. Study Aim

The study aims to create a relevant causal-predictive model that effectively identifies undergraduate students at risk of dropout in Thai HEIs - creating a model that accurately examines student risk factors to allow for institutional reforms and intervention, reduced student attrition, and improved institutional quality. A synthesis of existing studies examining factors impacting students in Thai HEIs will be investigated to understand overarching elements that explain the dropout process. By identifying and classifying factors, the researcher will attempt to synthesize findings into a casual model of student dropout risk. The theoretical model developed in this study will be derived from Thai contextual studies of student attrition over the past six years. The developed model will not depict a comprehensive process of a student's academic journey (K-12 to employment). Instead, it aims to give Thai HEIs the requisite information to comprehend the prevailing conditions affecting students. Consequently, institutions can pinpoint students with a heightened likelihood of withdrawal and discern the factors contributing to the increased probability of such an outcome.

3. Methodology

The synthesis will employ a mixed-method approach delineated and defined by the PRISMA 2020 method guidelines, emphasizing reporting transparency, describing what was executed, the rationale behind specific actions, and the results obtained (Page et al., 2021). This study comprises two distinct steps: the first identifies the resources selected for examination, and the second focuses on analyzing and synthesizing the findings. The analysis and subsequent outcomes of the literature synthesis will address the following questions:

1. What modern empirical studies have examined Thai higher education undergraduate students' attrition or persistence?
2. What descriptive and categorical variables have been identified in Thai regional studies to influence or moderate undergraduate student dropouts or perseverance?
3. What factors (direct or mediating) are prevalent in Thai regional studies investigating undergraduate student dropout or perseverance?

3.1 Document Identification

Multiple databases were explored to optimize the literature incorporated for synthesis. These databases comprised the Asian Citation Index (ACI), Education Resources Information Center (ERIC), ResearchGate, SAGE Publishing, and Thai Citation Index (TCI) up until 1 December 2022. Appendix A displays the search equations employed and the total records identified. Each search was conducted in English, cross-referencing search strings against a document's abstract, keywords, and title. The identified literature's reference sections were also examined as a secondary search. A publication year filter was applied, ensuring results were published no earlier than 1 January 2016 to align with institutional conditions arising from the Thai National Scheme of Education B.E. 2560-2579 (2017-2036). Even though 2016 preceded the new education act, Thai institutions were already familiar with the draft requirements as the previous national policy ended.

Specific exclusion criteria were imposed on the potential selection pool to maintain consistency. All selected literature had to feature a quantitative or mixed-method design that examines student dropouts in Thai universities. Research must focus on traditional HEI structures with a clearly stated identified population. Robust statistical analysis was preferred, but descriptive statistics were also included. Systematic reviews or

meta-analyses were excluded but reviewed for potential secondary sourcing of studies. A second researcher conducted an independent search using the exact keywords in the selected databases to avoid selection bias. After a three-stage literature analysis, both researchers compared their identified articles, with discrepancies discussed, to reach a consensus.

The search yielded 807 articles (Figure 1). After removing 84 duplicates, 723 documents were screened, with 20 being inaccessible. The remaining 703 were evaluated, eliminating documents that failed to meet inclusion criteria or were exempted due to exclusionary rules. The screening process ultimately included 17 documents from the databases. Analyzing citations within these documents revealed nine potential documents for screening, with two removed due to inaccessibility. The remaining seven documents were screened for eligibility, and four were included, resulting in 21 documents (Appendix B).

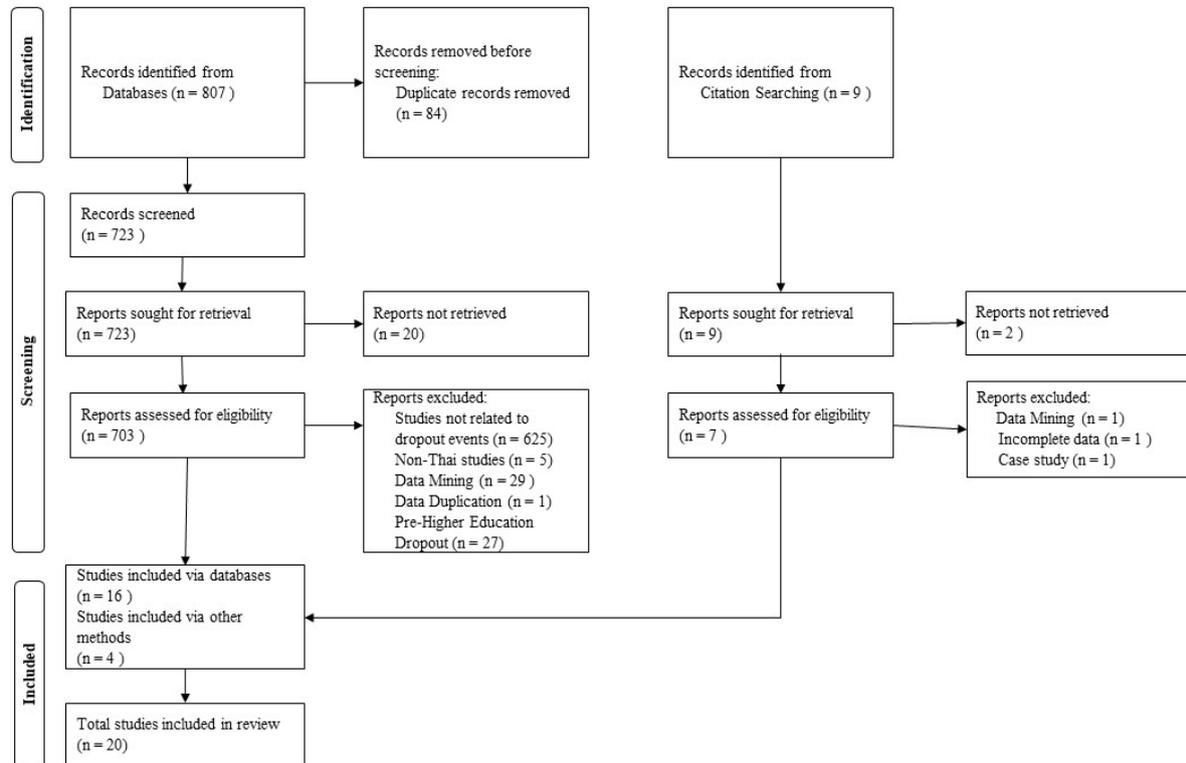


Figure 1. PRISMA 2020 Method Flow Chart

3.2 Document Analysis and Synthesis of Data

3.2.1 Demographic Variables

Demographic variables are any nominal indicator that aids statistical estimations by grouping an infinite population. A total of 50 unique demographic variables were identified, representing 107 instances across 18 studies; three studies did not refer to demographic variables in their analysis. The 50 variables were examined and clustered into seven groupings based on their definitions and associated taxonomies. The clusters are academic performance, home environment factors, geographical factors, HEI evaluation, school selection process, prior academic achievement, socioeconomic factors, and others (Table 1).

Table 1. Demographic Variable Clustering

Demographic Cluster	Variable Inclusion
Academic Performance n=1	Current GPA
Home Environmental Factors n=12	Family Dynamics, Father's Education, Father's Occupation, Friends, Head of Household Education, Mother Tongue, Mother's Education, Mother's Occupation, Number of Siblings, Parental Martial Status, Parent's Education, Parent's Employment
Geographical Factors n=2	Home Province, Home Region
HEI Evaluation and School Selection Process (Rationale) n=12	Admission Type, Class Year, Current Student Status, Education Goals, Faculty, Grade Importance, Major, Institutional Qualities, Program, Reason for Enrolling, University, Weekly Study Hours
Prior Academic Achievement n=5	English Rating, GPA in High School (Previous GPA), Math Rating, Pre-HEI Schooling (School Type), Prior Education
Socioeconomic Factors n=14	Accommodation, Age, Employment Status, Family Financial Support, Family Income, Family Monthly Income, Gender, Housing, Living Conditions, Martial Status, Monthly Expense, Monthly Income, Religion, Tuition Payment Concerns
Other n=4	Medical Conditions, Mental Health Conditions, Reasons for Dropout Thought, Nothing Stated (No Demographic Question Indicated in Study)

3.2.1.1 Academic Performance

Academic performance, represented by current GPA, reflects a student's self-reported undergraduate achievement. As Thai academic programs maintain minimum performance requirements, GPA is a standardized, cross-comparable measure (Sukthong, 2019). Studies suggest that students with GPAs near the cutoff (2.0) are likelier to discontinue their studies due to lower morale and decreased motivation (Sukthong, 2019; Pitanupong et al., 2020). Compan and Apibunyopas (2019) discovered a significant negative relationship between undergraduate GPA and dropout, indicating that lower-performing students were likelier to discontinue their studies. Khundiloknattawasa (2020) contends that GPA mirrors motivation or academic preparedness rather than serving as an influencing factor, claiming artificially inflating GPA would not necessarily offset negative motivational attributes or reduce dropout risk.

3.2.1.2 Home Environmental Factors

Home environmental factors categorize students based on their parents' background or family social conditions. Seven studies included at least one item from the cluster, with education-oriented items, such as parents' education, being the most predominant (Asavisanu, 2017; Meesuk, 2016; Rattanamanee, Topurin, & Panhun, 2018; Rujichinnawong, 2018). These studies suggested that higher education (HE) attainment by parents significantly reduces the likelihood of student dropout. Students with highly educated parents may receive more learning support and higher levels of expectation, which can instill a stronger foundation for education. The literature strongly associates a parent's occupation with the student's financial capabilities, degree selection, and motivation to persist in studies (Pitanupong et al., 2020). Students who seek acknowledgment from their parents or aim to make them proud may be more motivated to pursue their studies (Rattanamanee et al., 2018).

Other demographic items, such as family dynamics, large families, and friendship, were less frequently referenced but still impacted student persistence and dropout behavior (Boonprasom & Sanrach, 2019; Rujichinnawong, 2018; Sukthong, 2019). Family issues can be distracting, drawing students' attention away from their studies and reducing their academic and social integration. Larger families may lead to financial instability and emotional challenges due to the presence of multiple children attending school. A supportive friendship circle correlates positively with student persistence, contributing to their social integration (Boonprasom & Sanrach, 2019). However, a small or unsupportive social circle may hinder engagement in studies and increase the likelihood of dropout. Students with friends actively engaged in their studies are more likely to persist, whereas those surrounded by non-university-attending individuals may be more prone to procrastination (Rujichinnawong, 2018).

3.2.1.3 Geographical Factors

Geographical factors, comprising a student's home province and region, emerge in three studies as potential influences on dropout risk (Hanthongchai & Pengchan, 2019; Pitanupong et al., 2020; Sukthong, 2019). Hanthongchai and Pengchan (2019) argued that considerable distance between a student's home and educational institution negatively impacts success by decreasing parental supervision, leading to increased truancy and assignment neglect. Additionally, students from rural regions often face high expenses for travel and living accommodations in larger cities. This financial burden may reduce visits to home or from family members during semesters, exacerbating isolation and reducing direct support (Pitanupong et al., 2020).

Sukthong (2019) noted that travel's financial and emotional toll could affect students' motivation. Students may resort to more economical but time-consuming travel methods, diminishing face-to-face contact with friends or family. Though the studies in the synthesis did not directly associate geographical factors with academic integration, Other Thai literature cites regional disparities in K-12 academic achievement (Rattananuntapat, 2015; Scott & Guan, 2022). Lower K12 quality in rural Thai regions may negatively impact students' academic preparedness, increasing their dropout risk.

3.2.1.4 HEI Evaluation and School Selection Process

The cluster defines the qualities students consider necessary when selecting and persisting in an HEI program. Additionally, it includes categorizations of students by their current year of study and educational status, as evaluation occurs longitudinally. Students' current year of study is the most common element within the cluster, appearing in eight studies. Taipjutorus (2016) highlights first-year students' challenges, including academic, emotional, and social distress, during the transition to a post-secondary setting. These pressures are often exacerbated when students are far from their support networks. Studies have found that student withdrawal is more prevalent in the first year and gradually declines with each semester of university enrollment. Program selection determines a student's success and dropout risk (Pheunpha, 2020; Somumcharn, 2020). Students who select a program aligning with their intellectual capacities and interests are more likely to persist. However, students may be shocked by academic requirements and expected out-of-class commitments. Compan and Apibunyopas (2019) noted that while first-year attrition was generally high, program choice was a significant indicator of dropout risk among third-year students due to the heightened course load, increased assignment difficulty, and more substantial academic performance requirements.

3.2.1.5 Prior Academic Achievement

Prior academic achievement is crucial in determining a student's preparedness for the challenges and adversities in HE. This preparedness impacts students' ability to overcome obstacles and persist in their academic pursuits and future achievements (Khundiloknattawasa, 2020; Rujichinnawong, 2018). The prior academic achievement cluster consists of five identified demographic items: high school GPA, prior education, pre-HEI schooling, self-assessed English ability, and self-assessed math ability. High school GPA is often cited as a significant indicator of student preparedness and an indicator of post-secondary academic success (Asavisanu, 2017). Asavisanu's (2017) regression analysis determined that a student's high school GPA significantly predicted student persistence ($\beta = 0.038, \rho = 0.03$). However, Sukthong (2019) countered by stating that high school GPA is an inappropriate indicator of dropout risk, suggesting that existing university screening policies reduce the number of underprepared students for many university programs, mitigating its statistical relevance.

Prior education and pre-HEI schooling categorize students by the type of high school they attended (public or private). Thailand has recognized educational inequality regarding resources and teacher competency (Scott & Guan, 2022), with many public schools critically understaffed and undertrained (Buasuwan, 2018). These may be indicators of future coping issues with university demands. Asavisanu (2017) and Rujichinnawong (2018) noted that most students enrolled in international programs came from private high schools; however, neither assessed the influence of high school education type on higher education outcomes.

Khansawai (2018) found no significant relationship between previous education type and dropout risk but noted that academic requirements overwhelmed many students who dropped out, with lack of preparation or awareness possibly being the leading factor. Prakitpong's (2016) study indicated that not only did a student's previous education significantly impact their overall success and commitment to study, but there was a discrepancy between public and private higher education institutions. The difference was attributed to curriculum design and the reduced emphasis on student development courses within Thai private universities (Prakitpong, 2016).

3.2.1.6 Socioeconomic Factors

The most extensive demographic variable grouping identified in the studies represents socioeconomic

characteristics, categorizing respondents based on their financial status and social norming. Most studies reported a higher proportion of female respondents, with six studies indicating a ratio of nearly 3 to 1. Pitanupong et al. (2020) found that males were slightly more likely to consider dropping out of medical programs. In contrast, Asavisanu (2017) and Prakitpong (2016) referenced the moderating impact of gender on student dropouts. Overall, respondents were predominantly under 25 years old, with the majority between 18-22 years of age. Sukthong (2019) found no significant correlation between age and a student's decision to resign ($r = 0.06$, $p = 0.76$). Taipjutorus (2016) asserted that first-year students were more likely to drop out of their academic programs due to difficulties in integration and lower maturity levels.

Financial considerations were deemed vital for university students, as the cost of attendance can create considerable anxiety and stress for those with limited financial resources. Most respondents (40.5 - 70.6%) were from low-income families with an average of less than 10,000 THB per month. Lower income was a significant indicator of dropout risk for undergraduate students in all but Sukthong's (2019) study. Khundiloknattawasa (2020) noted that students working full-time jobs to support their expenses were more likely to be distracted in academic and social situations as they diverted their attention to their workplace.

3.2.2 Independent Variables

The 21 studies were examined to identify items in analyzing student dropout or persistence factors in Thai higher education, yielding 107 items representing 186 incidences. The items were clustered into nine distinct groupings based on definitions and associated taxonomies: academic integration, attitudinal and behavioral factors, classroom and institutional environment, emotional distress, family support, financial considerations, institutional support, social integration, and student satisfaction (Table 2).

Table 2. Independent Variable Clustering

Variable Cluster	Variable Inclusion
Academic Integration n=14	Academic Adjustment, Academic Factors, Academic Integration, Active with Homework, Background Knowledge, Instructor Interaction, Intellectual Development, Math Skills, Participation, Participation in Discussion, Student Involvement, Student Background, Student Factors, Writing Skills
Attitudinal and Behavioral Factors n=23	Attitude, Behavior, Commitment to Goal, Competency, Confidence in School, Dignity (Institutional Identity), Educational Commitment, Goal Setting, Institutional Identification, Learning Attitude, Student Learning Management, Mastery Goal Orientation, Motivation, Perceived Benefits, Performance-Approach Goal Orientation, Performance-Avoidance Goal Orientation, Personal Aspects, Personal Factors, Personal Motivational Goal Orientation, Self-Efficacy, Student Attitude, Student Motivation, Self-Regulated Learning
Classroom and Institutional Environment n=21	Autonomy, Classroom Climate, Classroom Conditions, Curriculum, Curriculum and Learning Space, Environment, Faculty Factors, Instruction, Instructor Attributes, Instructor Behavior, Instructor Factors, Meaningfulness, Physical Environment, Quality of Instruction, Teacher Attitude, Teacher Factor, Teaching Level, Teaching Style, Institutional Environment, Institutional Reputation, School Reputation
Family Support n=3	Family Factors, Family Support, Family Education Priority
Emotional Distress n=7	Coping Behavior, Emotional Conditions, Emotional Integration, Emotional Support, Health Issues, Mental Health, Student Issues
Institutional Support n=15	Academic Support, Advisors, Advisors' Style, Executive Factors, Institutional Engagement, Institutional Factors, Institutional Goal Structures, Institutional Mastery Goal Orientation, Institutional Participation, Institutional Performance Goal Structures, Institutional Support, Program Offerings, Number of Foundation Courses, Selection and Student Care, Teaching and Learning Management
Financial Considerations n=11	Cost, Economic Factors, Economic Problems, Economic Status, Family Income, Family Status, Financial Concerns, Financial Support, Socioeconomic Conditions, Socioeconomic Factors, Socioeconomic Status
Social Integration	Extra-Curricular Activities, Extra-Curricular Participation, Membership

Variable Cluster	Variable Inclusion
n=7	Requirements, Peer Interaction, Relationship with the Institution, Social Factors, Social Integration
Student Satisfaction n=2	Satisfaction, Student Expectations
Other n=4	GPA, GPA-HS, Location, Student Background

3.2.2.1 Academic Integration

Academic integration pertains to a student's engagement in the intellectual aspects of their university experience, involving active participation in coursework, developing academic comprehension, and fostering intellectual growth. It is distinct from social integration, which emphasizes personal interactions outside the classroom. Academic integration is crucial for understanding the factors contributing to student persistence and dropout risk in higher education.

Four studies found no significant relationship between academic integration and dropout risk (Asavisanu, 2017; Rujichinnawong, 2018; Sukthong, 2019; Tangcharoen, Naiyapatana, and Tungprapa, 2019). Asavisanu (2017) reported that although students who were academically integrated were less likely to drop out ($\beta = -0.007$), the findings were not significant ($\rho = 0.782$). Tangcharoen et al. (2019) attributed their findings to improvements in secondary schools' academic preparedness, which reduces the impact of academic integration on dropout risk.

Another set of four studies indicated that academic integration is important but did not directly measure its significance (Khundiloknattawasa, 2020; Prakitpong, 2016; Rattanamane et al., 2018; Taipjutorus, 2016). These studies found that students who lack maturity or parental supervision are less likely to be academically integrated (Khundiloknattawasa, 2020). Taipjutorus (2016) reported that students who strive to improve their academic preparedness through foundation programs are more academically integrated and satisfied with their overall academic experiences, thereby increasing their academic persistence. Those who fall behind early in their studies due to low participation are likelier to drop out (Rattanamane et al., 2018).

The remaining four studies determined that academic integration significantly predicted student persistence and dropout risk (Compan & Apibunyopas, 2019; Pitanupong et al., 2020; Prakitpong, 2016; Wareebor, Phibanchan, & Thongkhambunchong, 2020). Pitanupong et al. (2020) attributed the disconnect between students' expectations of their chosen programs and the reality of the academic demands, which influences their academic integration. Wareebor et al. (2020) emphasized the critical role of students' prior academic achievements and confidence in overcoming academic barriers and maintaining grit in challenging situations. Wareebor et al.'s study reported that academic integration strongly predicted persistence ($\beta = 0.394$, $\rho = 0.01$). The study specifically mentioned a student's math and writing skills contributing to academic struggles in higher university settings. Thus, proactive engagement in improving these skills is crucial for effective participation and academic success.

Prakitpong (2016) found a significant relationship between students' academic interaction and their commitment to education ($\beta = 0.399$, $\rho < 0.01$). The study highlights the importance of offering remedial courses to build students' confidence and promote long-term academic efficacy. These courses can help ease the transition into higher education, reducing the shock of traditional academic demands. Compan and Apibunyopas (2019) argued that academic integration is a crucial factor in student persistence, with a strong positive correlation between academic integration and persistence ($r = 0.61$, $p < 0.01$). The study found that well-integrated students are more likely to persist in their studies as they become more invested in their educational goals.

3.2.2.2 Attitudinal and Behavioral Factors

The attitudinal and behavioral factors related to students' academic experiences are deeply connected to self-determination theory (SDT), emphasizing the importance of competency, motivation, autonomy, and relatedness in student outcomes (Deci & Ryan, 2015). Research reveals that students' sense of competency, defined as their ability to tackle challenges and grow (Legault, 2017), significantly impacts their persistence and attitudes in higher education (Spady, 1971; Tinto, 1975). Taipjutorus (2016) and Krongkaew et al. (2018) emphasized that student attitudes can be fluid, often shaped by academic preparedness and the quality of institutional support. Meesuk (2016) found that attitudes predict dropout risk and vary based on the level of institutional support and academic preparedness ($\beta = -0.12$, $\rho = 0.042$).

Motivation serves as a pivotal driving force that influences student persistence and achievement. Thai students, in particular, often face significant external pressures to excel academically, mainly stemming from family expectations (Pitanupong et al., 2020). Multiple studies have explored how students' motivations, both intrinsic and extrinsic, are influenced by their educational context (Lerdpornkulrat, Koul, & Poondej, 2018; Hanthongchai & Pengchan, 2019; Taros & Phusee-om, 2020). These studies emphasize the importance of creating an educational environment that nurtures student motivation, thereby increasing their likelihood of persistence. Institutions that actively support their students through targeted student services can amplify this motivation and encourage academic success (Asavisanu, 2017).

Negative attitudes and behaviors have also been explored, revealing a correlation with an increased likelihood of academic dropout (Khundiloknattawasa, 2020; Pheunpha, 2020). Factors contributing to these negative attitudes include insufficient instructor communication, poor academic performance, and inadequate institutional support mechanisms. Wareebor et al. (2020) investigated these dynamics, finding a significant causal relationship between student attitudes and college adjustment, $\beta = 0.351, \rho < 0.01$.

Goal commitment is also integral to understanding student behavior and outcomes. One study found a strong correlation between goal commitment and external factors like family but did not establish a direct link between commitment and dropout rates (Wareebor et al., 2020). In contrast, other studies have noted that students with well-defined academic goals exhibit a greater tendency to persist through their educational journey, even in the absence of other mediating factors (Compan & Apibunyopas, 2019; Tangcharoen et al., 2019). Setting and striving toward academic goals appears dynamic, continuously influenced by early successes or failures and evolving educational ambitions (Rattanamaneet et al., 2018). Goal commitment is also integral to understanding student behavior and outcomes. Some studies found a strong correlation between goal commitment and external factors like family but did not establish a direct link between commitment and dropout rates (Wareebor et al., 2020). In contrast, other studies have noted that students with well-defined academic goals exhibit a greater tendency to persist through their educational journey, even without other mediating factors (Compan & Apibunyopas, 2019; Tangcharoen et al., 2019). Setting and striving toward academic goals is dynamic, continuously influenced by early successes or failures and evolving educational ambitions (Rattanamaneet et al., 2018).

3.2.2.3 Classroom and Institutional Environment

As primary contact points between students and universities, instructors play a crucial role in student integration, academic achievement, institutional reputation, and persistence (Rujichinnawong, 2019). The instructor's responsibilities are multifaceted, necessitating an understanding of students to adapt learning goals, engage with relevant material, and support diverse learning needs (Rattanamaneet et al., 2018). Institutions must equip instructors with resources, training, and support to develop the requisite attributes for success (Compan & Apibunyopas, 2019; Somumcharn, 2020). Pitanupong et al. (2020) discovered a significant correlation between medical students' dropout thoughts and perceived inadequate instructor support or excessive harshness. Negative interactions and insufficient confidence to engage instructors led to students departing their programs (Rattanamaneet et al., 2018; Somumcharn, 2020). Dissatisfaction arose when students felt unable to participate in discussions, attributing their disengagement to instructors' personalities, perceived subject knowledge, or cultural understanding (Asavisanu, 2017; Compan & Apibunyopas, 2019; Taros & Phusee-om, 2020).

Classroom climate transcends instructor personality and knowledge, encompassing content, resources, and program complexity. Course and curriculum meaningfulness influence students' intentions to stay (Lerdpornkulrat et al., 2016). Boredom-induced dissociation, while having a minimal direct correlation with attrition, can trigger declines in performance, integration, and satisfaction (Suthong, 2018; Taros and Phusee-om, 2020; Wongkongkaew, Kongkaew, & Tanchaypong, 2017). Outdated classroom designs, insufficient technological integration, program overcrowding, and external disruptions collectively contribute to a detrimental effect on academic integration, student satisfaction, and overall attrition rates, underscoring the need for timely and strategic improvements in educational settings (Boonprasom & Sanrach, 2019; Taros & Phusee-om, 2020; Wongkongkaew et al., 2017).

3.2.2.4 Family Support

Family support refers to a student's perception of their family's engagement in their university education. Tinto (1975) stressed family support's importance, noting that persistent students often have actively involved parents. Thus, close family connections may underpin intergenerational educational mobility by fostering expectations as the primary extrinsic motivator. Family factors predominantly involve a student's responsibility to support their family through caregiving or home duties. Studies by Rujichinnawong (2018), Sukthong (2019), and Taros and

Phusee-om (2020) reported low to moderate dropout risk due to pressures related to economic or healthcare support for parents. Students living closer to home may have reduced academic focus due to family support obligations (Taros & Phusee-on, 2020). For instance, Somuncharn (2020) found that students attending regional schools or those from economically impoverished rural areas face increased family burdens, substantially raising dropout risk.

Parental conflict significantly impacts dropout risk. Phuenpha (2020) established that students from conflict-ridden families are likelier to disengage from their studies. Fear of punishment and the resulting emotional distress hinder social and academic integration. Such students are less likely to form critical social bonds (Rujichinnawong, 2018). Conditional family support based on parental course recommendations also increases dropout risk (Sukthong, 2019). Rejecting parental recommendations may negatively affect the degree of emotional or financial support a family provides (Pitanupong et al., 2020), leading to demotivation and a higher statistical probability of student dropout (Phuenpha, 2020).

Family financial support, as opposed to family income and status, is an extension of support toward a student's academic goals (Pitanupong et al., 2020). Families that provide financial support relative to their means signal belief in the student's capabilities (Khansawai, 2018). Taros and Phusee-om (2020) found that the level of support correlates with dropout risk; financially supported students are more likely to graduate. However, Wareebor et al. (2020) argued that the family support construct was not significantly impactful on student dropout. Unfortunately, the explanation for this divergence from Khansawai (2018), Pitanupong et al. (2020), Sukthong (2019), and Taros and Phusee-om (2020) was not explained.

3.2.2.5 Emotional Distress

Emotional distress encompasses adverse emotional events that students may encounter in their learning or social engagement, which can impinge upon their participation and academic and social integration performance. Coping behavior pertains to a student's capacity to withstand stressful conditions. Within the context of the selected studies, coping behavior, emotional integration, mental health, and student issues broadly examine how students engage with their environments and the barriers they encounter. Phuenpha (2020) found that student coping behavior is considerably influenced by the support from their family and friend network. Students encountering challenges in social or academic integration depend significantly on the support of others to surmount obstacles. Students with existing mental health or coping limitations are at a distinct disadvantage from the outset of university (Sukthong, 2019). Consequently, integration complexities are exacerbated without adequate support from family or the institution (Phuenpha, 2020; Rujichinnawong, 2018). Emotional distress intensifies as students fail to integrate, attain desired goals, or feel connected to their environment, which further taxes mental health and increases disassociation (Wareebor et al., 2020).

Phuenpha (2020) revealed that students entering higher education with borderline academic achievement and limited support networks are 60% more likely to drop out of their undergraduate programs, with the second year experiencing the most significant declines. High dropout rates are linked to students' inability to adjust emotionally to the academic environment, with problems intensifying as the program advances (Wareebor et al., 2020), ultimately leading to an emotional crisis. Wareebor et al. (2020) found that students need considerable emotional resilience to succeed, yet emotional support from family was not a significant factor in their study.

Rujichinnawong (2018) observed that institutions significantly influence student adjustment, either reducing anxieties through administrative and faculty support or exacerbating barriers through restrictive regulations and limited psychological awareness. Sukthong (2019) found that parental emotional support and student emotional condition had a low overall impact on student departure decisions. Instead, students perceived low levels of institutional health service support as a more influential factor in their departure (Sukseethon, 2019). Sukthong (2019) suggested that the low impact of parental emotional support on student dropout is due to students' direct contact with the institution and the distance from their families. Students shift their dependency from parents to the institution for support when considerable distance exists.

3.2.2.6 Institutional Support

Institutional support involves an HEI's efforts to foster successful social and academic adjustment, academic performance, and student intellectual development. However, the massification and commodification of higher education have led many institutions to adopt a rigid, instrumental culture focused on satisfying students. Scott and Guan (2022) contend that transactional approaches prioritize retention over students' academic and personal development and may negatively impact students requiring additional personalized support as massification de-emphasizes humanistic approaches (Scott & Asavisanu, 2021)

Many new students require clear direction, often seeking guidance from instructors, advisors, or support groups (Pheunpha, 2020; Rattanamanee et al., 2018). Institutions identifying at-risk students and proactively developing personalized learning support systems can significantly enhance student success (Rattanamanee et al., 2018). Pheunpha (2020) found that the student learning management system and the institution's advisory relationship were the two most significant factors in determining student attrition risk. HEIs need a cohesive vision at the administrative level to govern services effectively (Boonprasom & Sanrach, 2019). Staff training, facility management, and asset procurement challenges often lead to inadequate student resources (Hanthongchai & Pengchan, 2019), impacting the quality of student support (Rattananuntapat, 2015). Students have noted that Thai HEIs merge services under the domain of a single department and few advisors, reducing availability or meaningful interaction (Rattananuntapat, 2015). Taros and Phusee-om (2020) explained that students who failed to complete their university programs attributed their decision to the lack of cohesive institutional support and meaningful consultation opportunities. The cognitive and emotional connection to the school is bound by the student's belief that the institution shares similar outcome goals; limited opportunities for connection and relationship formation with administrators increase dropout risk significantly (Lerdpornkulrat et al., 2016).

Institutional factors governing student expectations impact student interaction with staff and overall engagement with the university. Meesuk's (2016) study found that institutions consistently shifting program requirements without appropriate communication cause students to feel ostracized. Studies by Boonprasom and Sanrach (2019), Rujichinnawong (2018), Sukthong (2019), and Taros and Phusee-om (2020) revealed that students felt rules and regulations were overly strict, particularly regarding course schedules and required workload. Institutions must consider students' academic needs for future success; supportive management that promotes appropriate content enhances student confidence and reduces dropout intentions (Rujichinnawong, 2018; Sukthong, 2019). Better program structuring and institutional awareness can help students, particularly those initially struggling academically (Prakitpong, 2016; Sukthong, 2019).

3.2.2.7 Financial Considerations

Financial consideration involves a student's cost-benefit analysis to determine if continuing education at their current university will benefit their financial situation or future goals. This analysis evaluates current and future benefits against immediate costs and opportunity costs. The financial consideration construct also examines external factors (socioeconomic and political) that may pressure students to withdraw from their studies. Tinto's (1993) model acknowledges that students from working-class families may experience financial instability. However, he argues that withdrawing from an institution due to finances is often an extension of dissatisfaction rather than pure economic pressure. However, Tinto's argument is limited by first-world views of education and the ability to obtain financial support. Increasing tuition costs, reduced government aid, and rising loan rates contribute to economic pressures and student attrition, particularly in Thai private HEIs (Asavisanu, 2017). Although some institutions offer bursaries or scholarships, the application process is often complicated, and information is not readily available. Limited interaction between students and administration further hinders the disseminating of scholarship information to those in economic need (Khansawai, 2018; Khundiloknattawasa, 2020).

Inflationary pressures and income disparities increase dropout risk among students. Students without financial support or from financially limited families are more at risk of attrition (Wongkongkaew et al., 2017) and mental health crises (Sukthong, 2019). Tinto's (1993) assessment that students will endure economic hardships for long-term gains does not consider the significant hardships faced by supporting family members. Thai students are aware of the impact of increased tuition costs on family dynamics, leading to a focus on short-term costs over potential long-term gains (Boonprasom & Sanrach, 2019), as their families often struggle to make ends meet (Rujichinnawong, 2018). Cost plays a significant role in HEI selection, engagement, and retention (Asavisanu, 2017; Boonprasom & Sanrach, 2019; Wongkongkaew et al., 2017). Although the Thai government has enacted numerous reform policies, students of low socioeconomic status continue to be financially constrained, resulting in limited upward mobility (Rujichinnawong, 2018).

3.2.2.8 Social Integration

Social integration refers to a student's engagement in new social conditions at university through extra-curricular activities and peer interaction. It involves developing new communities or relationships that create shared experiences and understanding, resulting in a psychological belief that students fit in with their peers at school. Asavisanu (2017) explained that social integration is critical, where integration into a community facilitates academic persistence. Social and academic integration are complementary and reciprocal but remain independent elements of a student's higher education experience.

The impact of social integration on student dropout varied among studies, with four finding it a significant indicator (Asavisanu, 2017; Compan & Apibunyopas, 2019; Prakitpong, 2016; Rattanamanee et al., 2018). Asavisanu (2017) found that social integration was the strongest indicator for academic persistence in international universities, with $\beta = 0.113$, $\rho < 0.001$, attributing the importance to students wanting to exchange ideas and reduce academic burdens. Compan and Apibunyopas (2019) determined an inverse relationship between social integration through extra-curricular activity participation and student attrition ($\beta = -0.105$, $\rho = 0.05$), indicating that forming communities at the school and engaging with classmates and instructors outside the classroom significantly reduces student attrition. Social groups work together to reduce barriers and increase success with a positive support network (Compan & Apibunyopas, 2019).

Prakitpong (2016) determined that social integration was significant in students' intention to persist; however, the value of social communities was more influential in private universities. Similarly, Asavisanu (2017) noted that strong social groups enhance students' ability to engage in complex academic content that otherwise forms barriers to an average student's learning. Social integration allows a student to find peers who can help explain and reinforce concepts and ideas through exchanging ideas and thoughts, cooperating, and providing positive encouragement to persevere. The coupling and formation of social peer networks significantly predict a student's academic persistence.

Three studies within the selected literature indicated that social integration was an influential factor affecting student dropout; however, the significance was not directly measured. Khansawai (2018) determined that social integration and peer interaction were moderately related to student dropout risk. Students who failed to find social networks and adequately communicate with their peers were at greater risk of mental health issues and low academic morale (Khansawai, 2018). Somumcharn (2020) showed that low social interaction correlates with numerous issues that could intensify dropout risk. Students with poor interpersonal communication skills or low confidence participate far less in class discussions and out-of-class activities. Isolation and lack of social experiences increase psychosocial anxieties, increasing the risk of mid-program departure (Somumcharn, 2020).

Pitanupong et al. (2020) noted that strong social bonds helped students overcome difficulties from in-class pressures, academic anxiety, and personal issues. Social integration concerns were highest among first-year students as they attempted to navigate new environments; however, the overall impact of social integration and peer communication had a negligible impact on students' dropout thoughts after the first year (Pitanupong et al., 2020). The declining impact was attributed to students adjusting to their conditions and academic environment.

3.2.2.9 Satisfaction

Student satisfaction involves the assessment of educational experiences compared to expected outcomes. It occurs when students perceive that academic, institutional, and social conditions meet or surpass their preconceived expectations. Thai universities are adjusting their programs and enrollment strategies to meet growing student expectations, although meeting all needs is costly and unlikely to achieve total satisfaction (Prakitpong, 2016). Faculty training, innovative classroom methods, program modifications, and interactive courses can provide essential skills while addressing student demands (Rujichinnawong, 2018). Satisfaction significantly correlates with student development, engagement, social integration, and overall academic performance and negatively correlates with dropout risk (Compan & Apibunyopas, 2019).

Students often enter higher education without understanding the expectations required to succeed (Prakitpong, 2016). Previous learning environments or external factors might create initial gaps that are challenging for new students to overcome (Pitanupong et al., 2020). Popular fields of study in Thailand, such as finance, information technology, and business English, experience considerable satisfaction variations among students, mainly due to a lack of awareness of the program's prerequisites (Taipjutorus, 2016). The paucity of student understanding concerning program requirements is frequently attributable to impulsive program selections, often driven by the desire to appease parental expectations or accommodate financial constraints (Pitanupong et al., 2020). When institutions prioritize enrollment over student capability, there is less emphasis on aligning prospective students' expectations with the institution. Information exchange outlining program goals and requirements is often insufficient, and communication between the administration and students before the program starts is minimal (Rujichinnawong, 2018). The drive to maximize enrollment sacrifices rigor, diminishing satisfaction over the long term.

4. Model Development

The multidimensional model of student dropout risk (MMSDR) offers a comprehensive framework to understand student retention and attrition in Thai universities (Figure 2). It integrates critical concepts from seminal theories by Bean, Tinto, Astin, and Spady. The model outlines seven distinct phases affecting students

and their academic outcomes. The first phase focuses on external factors that neither the student nor the institution can control, such as market conditions and political stability. These conditions can have a profound impact on academic choices and performance. For example, the uncertainty generated from the COVID-19 pandemic had disrupted many students' academic plans and experiences.

The second phase focuses on students' demographic and social characteristics, such as sociocultural background, home environment, and geographical location. These attributes can shape academic outcomes and are influenced by external factors like economic shifts or government policies. For example, changes in the Thai economy may impact parental occupations, thereby affecting a student's socioeconomic status. The third phase considers institutional selection factors. These encompass how students evaluate HEIs, their prior academic achievement, family support, and financial considerations. External factors shape these constructs; for instance, social norms can affect how students perceive different institutions and what financial aid they may receive.

The fourth phase addresses institutional integration, categorized into academic and social aspects. Academic integration involves performance and faculty interaction, while social integration pertains to community involvement and campus belonging. Both significantly impact a student's decision to continue or discontinue their education. The fifth component considers various forms of support, including from institutions, family, peers, and personal resources like self-efficacy. These multifaceted support systems interact to influence academic persistence and success. For example, institutional support may include academic advising, while family support can span emotional, financial, and academic domains.

The sixth element looks at coping strategies students employ to manage challenges. These can be adaptive, like problem-solving and seeking support, or maladaptive, such as avoidance and denial. Effective coping mechanisms are crucial for persistence in higher education. The final component examines the outcomes of academic choices, which can be persistence or withdrawal. Withdrawal is further classified into forced withdrawal, voluntary withdrawal, and intent to transfer. Forced withdrawal directly relates to academic performance, while the decision to withdraw or transfer results from an accumulation of factors through an individual evaluative process.

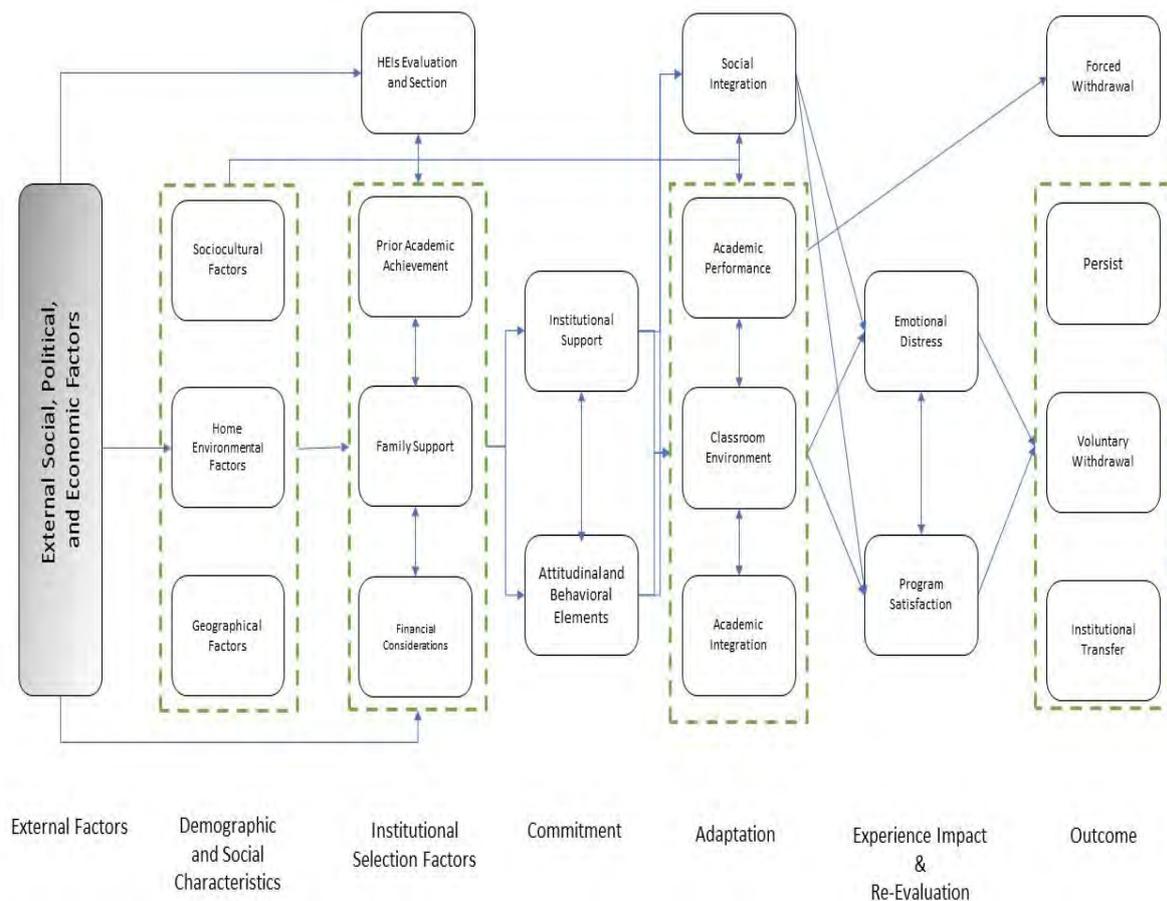


Figure 2. Multidimensional Model of Student Dropout Risk (MMSDR)

5. Conclusion

This systematic review identified numerous factors influencing students' decisions to persist or withdraw from Thai universities. Academic integration, attitudinal and behavioral factors, classroom and institutional environment, family support, emotional distress, institutional support, financial considerations, social integration, and student satisfaction are critical in shaping students' experiences and outcomes. Academic and social integration, emotional support, and a supportive institutional environment are crucial for fostering students' intellectual growth, sense of belonging, and academic persistence. Family support and financial considerations significantly impact students' decisions to continue their education, with financial anxiety levels and socioeconomic background influencing the accessibility of education. Attitudinal and behavioral factors, such as student motivation, competency, autonomy, and relatedness, also contribute to academic success and persistence.

HEIs must focus on fostering students' academic and personal growth by providing resources and opportunities for active engagement in coursework, intellectual development, a sense of belonging within the academic community, and social integration. Institutional support, practical faculty training, interactive courses, and innovative pedagogical approaches can meet student needs and impart essential skills. Aligning prospective students' expectations with the institution and cultivating a supportive academic and social environment are crucial for increasing satisfaction and minimizing dropout risk. Utilizing the MMSDR framework enables researchers, educators, and policymakers to comprehensively understand factors influencing students' persistence and dropout risk within Thai higher education institutions. This understanding is vital for devising targeted interventions and informed policy decisions that foster academic success and ensure the long-term efficacy of higher education institutions.

5.1 Implications

This study's developed model offers a nuanced understanding of the multi-factorial conditions impacting Thai university undergraduate students. By integrating academic, economic, emotional, institutional, personal, and social dimensions, the model not only builds upon seminal frameworks by Astin, Bean, and Tinto but also adapts them to the specific context of Thailand. This regional focus is significant, as it aims to provide a comprehensive yet localized tool for identifying at-risk students. The insights generated could serve as the basis for targeted campaigns to reduce dropout rates, thereby enhancing student experience and institutional quality. Notably, the model's integration of theoretical and localized perspectives offers a more robust understanding of the intricate cause-effect relationships contributing to student attrition, providing actionable strategies for educational stakeholders.

5.2 Limitations

This study has several limitations that should be considered. The first limitation is its narrow focus on Thai universities, which could limit the generalizability of the findings to other educational contexts. Second, the study only synthesizes research from the past six years, potentially omitting valuable insights from studies conducted outside this time frame. Third, the model developed is explicitly tailored to undergraduate students, omitting other educational levels like graduate or vocational students. Fourth, the limited scope of databases used for literature synthesis may exclude relevant studies that could enhance the model's robustness. Lastly, the model does not aim to depict a student's complete academic journey, focusing instead solely on identifying factors related to the risk of dropout in Thai HEIs. Future studies could address these limitations by expanding the scope and incorporating a more diverse range of data and contexts.

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Authors contributions

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Obtained.

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Data sharing statement

No additional data are available.

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Appendix

Appendix A

Search Equation Utilized in Stage One of the Synthesis Process

Search String	Records
ERIC - The Education Resources Information Center	63
TITLE-ABS-KEY: "Thailand AND University AND Dropout"	1
TITLE-ABS-KEY: "Thailand AND University AND Attrition"	1
TITLE-ABS-KEY: "Thailand AND University AND Retention"	9
TITLE-ABS-KEY: "Thailand AND University AND Persistence"	2
TITLE-ABS-KEY: "Thailand AND University AND Withdrawal"	0
TITLE-ABS-KEY: "Thailand AND University AND Graduation Rates"	0
TITLE-ABS-KEY: "Thailand AND University AND Student Satisfaction"	10
TITLE-ABS-KEY: "Thailand AND Higher Education AND Dropout"	2
TITLE-ABS-KEY: "Thailand AND Higher Education AND Attrition"	0
TITLE-ABS-KEY: "Thailand AND Higher Education AND Retention"	5
TITLE-ABS-KEY: "Thailand AND Higher Education AND Persistence"	3
TITLE-ABS-KEY: "Thailand AND Higher Education AND Withdrawal"	0
TITLE-ABS-KEY: "Thailand AND Higher Education AND Graduation Rates"	0
TITLE-ABS-KEY: "Thailand AND Higher Education AND Student Satisfaction"	11
TITLE-ABS-KEY: "Thailand AND College AND Dropout"	2
TITLE-ABS-KEY: "Thailand AND College AND Attrition"	1
TITLE-ABS-KEY: "Thailand AND College AND Retention"	4
TITLE-ABS-KEY: "Thailand AND College AND Persistence"	5
TITLE-ABS-KEY: "Thailand AND College AND Withdrawal"	0
TITLE-ABS-KEY: "Thailand AND College AND Graduation Rates"	1
TITLE-ABS-KEY: "Thailand AND College AND Student Satisfaction"	6
SAGE Journals	23
Title-KEY: "Thailand AND University"	13
TITLE-ABS-KEY: "Thailand AND Higher Education"	7
TITLE-ABS-KEY: "Thailand AND College"	3
ResearchGate	68
TITLE-ABS-KEY: "Thailand AND University AND Dropout"	2
TITLE-ABS-KEY: "Thailand AND University AND Attrition"	4
TITLE-ABS-KEY: "Thailand AND University AND Retention"	2
TITLE-ABS-KEY: "Thailand AND University AND Persistence"	0
TITLE-ABS-KEY: "Thailand AND University AND Withdrawal"	0
TITLE-ABS-KEY: "Thailand AND University AND Graduation Rates"	20

Search String	Records
TITLE-ABS-KEY: "Thailand AND University AND Student Satisfaction"	7
TITLE-ABS-KEY: "Thailand AND Higher Education AND Dropout"	2
TITLE-ABS-KEY: "Thailand AND Higher Education AND Attrition"	1
TITLE-ABS-KEY: "Thailand AND Higher Education AND Retention"	4
TITLE-ABS-KEY: "Thailand AND Higher Education AND Persistence"	0
TITLE-ABS-KEY: "Thailand AND Higher Education AND Withdrawal"	0
TITLE-ABS-KEY: "Thailand AND Higher Education AND Graduation Rates"	1
TITLE-ABS-KEY: "Thailand AND Higher Education AND Student Satisfaction"	6
TITLE-ABS-KEY: "Thailand AND College AND Dropout"	0
TITLE-ABS-KEY: "Thailand AND College AND Attrition"	1
TITLE-ABS-KEY: "Thailand AND College AND Retention"	3
TITLE-ABS-KEY: "Thailand AND College AND Persistence"	2
TITLE-ABS-KEY: "Thailand AND College AND Withdrawal"	0
TITLE-ABS-KEY: "Thailand AND College AND Graduation Rates"	12
TITLE-ABS-KEY: "Thailand AND College AND Student Satisfaction"	1
The ASEAN Citation Index (ACI)	155
TITLE-ABS-KEY: "University AND Dropout"	46
TITLE-ABS-KEY: "University AND Attrition"	30
TITLE-ABS-KEY: "University AND Retention"	5
TITLE-ABS-KEY: "University AND Persistence"	1
TITLE-ABS-KEY: "University AND Withdrawal"	0
TITLE-ABS-KEY: "University AND Graduation Rates"	0
TITLE-ABS-KEY: "University AND Student Satisfaction"	73
Thai Journal Citation Index Centre (TCI)	498
TITLE-ABS-KEY: "University AND Dropout"	79
TITLE-ABS-KEY: "University AND Attrition"	18
TITLE-ABS-KEY: "University AND Retention"	4
TITLE-ABS-KEY: "University AND Persistence"	1
TITLE-ABS-KEY: "University AND Withdrawal"	0
TITLE-ABS-KEY: "University AND Graduation Rates"	3
TITLE-ABS-KEY: "University AND Student Satisfaction"	393

Appendix B

Selected Documents from Synthesis

Author(s)	Year	Title	Text
Asavisanu	2017	Student attrition: A study of risk factors in an international university	English
Wongkongkaew, Kongkaew, and Tanchaypong	2017	Cause of student dropout of accountancy program as usual attitude of regular students, Department of Accounting, Rajabhat Kamphaengphat University	Thai
Prakitpong	2016	Increasing the academic commitment to reduce dropout of undergraduate students in engineering: an analysis of causal factors with structural equation model	Thai
Sukseethong	2019	Factors associated with cause of the resignation from Public Health Sciences students at Chiang Mai Rajabhat University: View current student	Thai
Rujichinnawong	2018	A study on the reasons for the student's dropout of Mahidol University International College (MUIC). Students during the academic years 2016/17 to 2017/2018	English
Pitanupong et al.	2020	Dropout thought among medical students at Faculty of Medicine Prince of Songkla University.	English
Lerdpornkulrat, Koul, and Poondej	2016	Relationship between perceptions of classroom climate and institutional goal structures and student motivation, engagement and intention to persist in college	English

Author(s)	Year	Title	Text
Taipjutorus	2016	Reducing attrition rate of RMUTP first-year undergraduate students using the pre-university program	Thai
Meesuk	2016	Factors affecting to vocational students' dropout decision in Central Vocational Education Institute Area 1	Thai
Khansawai	2018	Factors affecting achievement in course enrollment and studenthood termination of undergraduate students at-risk condition of studenthood termination at Mahasarakham University	Thai
Krongkaew et al.	2018	Causes of undergraduate student dropout at Kamphaeng Phet Rajabhat University	Thai
Rattanamane, Topurin, and Panhun	2018	A discriminant analysis of dropout factors undergraduate students in Burapha University	Thai
Boonprasom and Saenrat	2019	The exploratory factor analysis of undergraduate students' dropout at Ubon Ratchathani Rajabhat University	Thai
Compan and Apibunyopas	2019	Causal model of dropout of students at Walailak University	Thai
Hanthongchai and Pengchan	2019	Factors affecting to drop out and survival pathways of first year undergraduate students of Institute of Physical Education Udonthani	Thai
Pheunpha	2020	Dropout factors of students of Business Administration Faculty	Thai
Tangcharoen, Naiyapatana, and Tungprapa	2019	Discriminant factors of students' persistence and dropout from regular program for undergraduate students at Rajamangla University of Technology in Bangkok 1	Thai
Khundiloknattawasa	2020	The causes of dropout students in Faculty of Humanities and Social Sciences at Nakhon Sawan Rajabhat University	Thai
Somumcharn	2020	A study of problems and guidelines for solving problems of dropout students in Buengkan Technical College	Thai
Taros and Phusee-om	2020	Discriminant factors of undergraduate dropouts in Mahasarakham University	Thai
Wareebor, Phibanchan, and Thongkhambunchong	2020	Dropout and persistence phenomena of undergraduate students of Burapha University: the causal relationship model	Thai