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Title

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Journal

Higher Education Working Paper Series, 26(5)

Author

Kim, Hoyun

Publication Date

2026-10-27

Higher Education Working Paper

Volume No. 26-5

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Hoyun Kim, Berkeley School of Education, University of California, Berkeley

Suggested citation: Kim, H. (2026) Articulating Efficiency and Equality in College Access: A Systematic Review of Statewide Transfer Articulation Research. *CSHE Higher Education Working Paper Series*, Vol. 26-5. Retrieved from: escholarship.org/uc/item/46k9j0wn

**Articulating Efficiency and Equality in College Access:
A Systematic Review of Statewide Transfer Articulation Research**

Hoyun Kim

Berkeley School of Education, University of California, Berkeley

Abstract

Vertical transfer is increasingly promoted as a strategy to advance equitable access to higher education, yet research on state-level transfer articulations (STAs) shows mixed evidence regarding their effectiveness, and there exist difficulties and inconsistencies in how this is evaluated. This systematic review examines the empirical literature on STA policies in U.S. higher education to interrogate: (a) how scholars motivate the objectives and value of STAs; (b) what methods and criteria are used to assess policy implementation; and (c) how these two align. I find that while credit loss is ubiquitous as a motivating problem, no study directly measures it. Furthermore, while studies frequently justify STAs through principles of educational equality and serving disadvantaged populations, they often fail to treat marginalized groups as primary populations of analytical interest. Future research must improve alignment between motivating policy principles and empirical choices, making explicit how success is defined, measured, and for whom.

Keywords: college transfer, college access, transfer articulation, equity, education policy

Articulating Efficiency and Equality in College Access: A Systematic Review of Statewide Transfer Articulation Research

How does research evaluate whether a policy is “working”? Traditionally, researchers must establish the *intent* of a policy and define the *criteria for success*. Yet both of these elements are often unclear and contested in the context of education policy (Espinoza, 2007; Young & Diem, 2017). *Statewide transfer articulations* (STAs) are policies that outline at the state-level what college credit can transfer across postsecondary institutions; they vary in both purpose and practice (Whinnery & Peisach, 2022), making investigating programmatic success doubly complicated. There is little consensus on how to define successful transfer, or how to evaluate policies aimed at improving postsecondary systems to facilitate transfer (Roksa, 2009). Three prior reviews of the literature exist on transfer and articulation (Kintzer, 1989, 1996; Mosholder & Zirkle, 2007), but were largely historical and predate the recent wave of causal inferential and implementation studies. The large uptakes in both state intervention in public higher education systems and research on the topic since the 21st century (Katsinas et al., 2019) underscores the need for a policy-focused review of the literature.

This systematic literature review offers an exhaustive overview of how the empirical literature on STAs has defined policy success—and more broadly, system-wide success—in implicit and explicit ways. Specifically, it examines how scholars operationalize this success through principles of efficiency and equality that shape their research motivations and empirical choices. Beyond synthesizing the STA literature itself, this analysis also serves as a case study of how higher education research frames policy issues and employs empirical methods. While the institutional transfer of students and college credit are not exclusive to the U.S. (Lang, 2007; Pizarro Milian & Zarifa, 2021) I foreground the U.S. context as the primary analytic case. The

nation's federated structure yields substantial policy variation across 50 states and a comparatively rich evaluation record, rooted in a history of community colleges and transfer pathways unique to U.S. public education (Kisker et al., 2023).

This paper is organized as follows. First, I motivate the context of the study with a review of transfer from community colleges to four-year colleges and the role of STAs. I then introduce a typology of four different principles (efficiency, equal educational opportunity, equal educational outcomes, and equal social outcomes) that underlie the policy objectives presented in education policy literature, alongside empirical examples of these values. Using this typology, I conducted a systematic literature review to answer the following research questions:

- (1) What policy objectives and principles motivate empirical research on STAs?
- (2) What empirical approaches, outcomes, and findings characterize the literature on STAs?
- (3) To what extent do the empirical approaches and outcomes examined align with the policy objectives and principles that motivate research on STAs?

I find that while many studies highlight credit loss as a major issue, none actually attempt to measure it. I also find that the literature on statewide transfer articulations overwhelmingly frames STAs in terms of systemic efficiency and cost-saving for students. Although many studies invoke the role of STAs in furthering educational equality and acknowledge that they impact disadvantaged students, these commitments to educational equality are not always reflected in the populations and outcomes that are actually examined by the studies.

Background

Vertical transfer, transferring from a community college into a four-year institution, constitutes a significant aspect of the higher education landscape within the United States. In theory, beginning one's higher education journey in community college reduces the overall cost

of a baccalaureate degree, improving accessibility in terms of financial cost. Yet vertical transfer systems have not yielded straightforward outcomes: the six-year baccalaureate degree attainment rate of those who transfer from a community college is estimated to be roughly 16% (Velasco et al., 2024). A meta-analysis on the effects of enrolling in community college as opposed to four-year institutions found that entering a community college was associated with a 23-percentage-point decrease in the probability of baccalaureate attainment, on average, compared to entering a four-year college when controlling for all other variables (Schudde & Brown, 2019). Some scholars attribute these low rates to structural challenges, such as course credit not transferring between institutions—also known as *credit loss*—and prolonged time to degree completion leading to accumulation of student loans (Spencer, 2023).

With the majority of disadvantaged students having begun their academic careers at community colleges, investing in the transfer process and supporting transfer students becomes a matter of making baccalaureate and other postsecondary degrees more accessible to all students, but particularly populations that face barriers and challenges to progressing at a normative timeline (Schudde & Goldrick-Rab, 2015; U.S. Department of Education, 2023). Only 8% of all students who transfer and graduate are estimated to follow the 2+2 model for college transfer—where two years are spent in community college and two years are spent in the receiving institution (Fink & Jenkins, 2017). Rather, many students take longer to graduate and may even transfer between institutions more than once in a pattern called “swirling” or “strategic swirl” due to circumstances or needs (Kolby, 2026; Spencer, 2021). Moreover, as many as 62.9% of Students of Color have enrolled in a community college before ultimately attending a four-year institution (U.S. Department of Education, 2020).

Transfer Articulation and State Involvement

Articulation agreements, generally speaking, are agreements between postsecondary institutions that mitigate complications in college transfer by aligning the exit requirements of a community college with the receiving four-year institution and its programs of study (Ignash & Townsend, 2000). While articulations were traditionally agreements established between individual institutions, they do more than codify course equivalency to transfer college credit. In recent times, articulations have evolved to refer to programs and policies packaged together to facilitate vertical transfer, becoming closely tied to the issue of college access.

Consequently, state governments have increasingly become involved in articulations in the form of STAs. States have been establishing transfer articulation policies and programs between public two-year and four-year systems since the 1990s, while also standardizing the measurement and reporting of college transfer rates (Kintzer, 1996). STAs are intended to introduce consistency to improve systematic efficiency, addressing causes of credit loss and the need for transfer students to retake comparable courses (Grote et al., 2020). States also aim to use them to improve transfer student outcomes such as degree attainment and time to completion by supporting student academic momentum (Boatman & Soliz, 2018; Spencer, 2021).

Diversity in STAs and the Analysis of STAs

By extension, scholars and stakeholders have pointed to STAs as a critical avenue to improve equity and inclusion of underrepresented minorities in higher education (Roksa, 2009; Logue et al, 2023). Despite the speculated benefits of STAs, studies have found inconsistent results. For example, one study finds that an STA in California that created associates degrees for transfer for specific majors encouraged statistically significant increases in the number of students graduating with associate degrees in impacted departments, but not transfer (Baker, 2016). Yet a

later study of the same policy found some evidence that the policy increased transfer and, as a result, mediated a small increase in bachelor's degree attainment, but the policy itself did not directly increase the likelihood that students ultimately earned a bachelor's degree (Baker et al., 2023). Thus, even when STAs appear to improve one outcome, those improvements do not necessarily translate into the broader outcomes that the policies are intended to promote. STAs also exist in many different forms, making assessment difficult and defining success all the more necessary. According to the Education Commission of the States' 50-state comparison of STAs, 35 out of 50 states have statewide guaranteed transfer of an associate degree, but only 20 out of 50 states have a uniform course numbering convention used at all public postsecondary institutions for lower-division courses (Whinnery & Peisach, 2022). STAs themselves are also inconsistently studied with a variety of metrics and outcomes of interest (Roksa, 2009). For instance, scholars have debated whether STAs should increase transfer rates, or whether the policies should focus on credit efficiency and reducing costs to a bachelor's degree for students (Anderson et al. 2006; Cohen 1996; Higgins and Katsinas 1999; Roksa 2006; Stern 2016). These goals can reinforce one another, but they do not always do so. This variation makes it important to examine not only whether STAs "work," but also what outcomes researchers believe these policies are intended to achieve and how they choose to measure success. Doing so can provide a clearer picture of what the existing research tells us about STAs and help inform policy decisions, practice, and future research.

Constructing a Typology of Principles in Education Policy

STAs, like other types of educational policies, programs, and initiatives, can promote multiple values and objectives. Roksa and Keith (2008) reviewed STA policy documents and found that STAs historically have not existed for the purpose of improving transfer rates, but to

prevent credit loss when students do choose to transfer between postsecondary institutions within the state. In other words, STAs are associated with improving efficiency in the college transfer system. Because STAs have implications for ease of vertical transfer, they also have implications for ease of access to baccalaureate degrees and inequalities in access to higher education. Thus while STAs in practice may or may not have changed since their inception, their explicitly stated objectives have at times been oriented towards the furthering of equality and equity in higher education. However, various notions of equality and equity in education systems are invoked by stakeholders interchangeably (Espinoza, 2007) and with limited clarity on empirical meaning. In this section, I address this by identifying and defining four principles underlying the policy objectives in the education literature: (a) efficiency, (b) equal educational opportunity, (c) equal educational outcomes, and (d) equal social outcomes. Each concept is followed by examples in the context of the vertical transfer process in higher education.

Efficiency

Education policy scholarship often emphasizes the importance of improving *efficiency*—reducing costs and/or maximizing value—in postsecondary systems. Such emphasis is particularly popular amidst the rising cost of college enrollment for individuals, the state, and institutions. Historically, promoting systemic efficiency has been positioned as being at odds with equality-related language (Windham, 1972). Under a human capital framework, students have different capacities to benefit from the same education or degree of investment, making investing in particular students a more efficient investment (i.e., yielding higher returns) than in others (Becker, 1967). Education policy promotes systemic efficiency in two senses: productivity (i.e., increasing quantity of output) and cost reduction (e.g., expedience in outcomes or reducing financial costs). In the context of vertical transfer in higher education, emphasizing the need for

systemic efficiency can look like being concerned with improving low student transfer and degree attainment rates, or mitigating credit loss because inefficiencies in credit transfer can actually force students to retake courses, costing time and money (de los Santos Jr. & Sutton, 2012). Hence, improving efficiency in the transfer system entails increasing “production” of students who transfer or earn a college degree and/or reducing costs in the process.

Equal Educational Opportunity

The first type of equality commonly alluded to in education policy is that of *equal educational opportunity*, which derives from the notion that educational opportunities are not equally distributed, making equality in opportunistic distribution a social good to aspire to. To this end, the Equality of Educational Opportunity Report—popularly known as the Coleman Report—was commissioned by the U.S. government in 1964 as a follow-up to *Brown v. Board of Education* to examine whether segregation was still present in schools such that some districts were underfunding schools with predominantly minority students (Coleman et al., 1966). Here, equal school funding was a key indicator for whether minority students were being provided with the same resources, and by extension, the same opportunities.

Having equal material resources, however, does not inherently yield equal opportunities. This is because opportunity is defined by real agency and choice rather than purely resource distribution. Navigating this distinction requires differentiating between equality and equity: While *equality* refers to the distribution pattern of something that is either measurable (e.g., income) or abstract (e.g., power) among members of a group, *equity* “refers to social justice or fairness [and] involves a subjective moral or ethical judgment,” (Farrell, 2022, p. 170) regarding distribution. Consequently, achieving equity often requires measurable inequalities in resource allocation to account for individuals’ different needs. In this sense, the phrases “equal

opportunity” and “equity” are deeply intertwined through principles of distributive justice (Burbules et al., 1982). Educational systems achieve true equal opportunity when resources are distributed justly (i.e., fairly) to eliminate systemic barriers, ensuring all individuals possess the agency to pursue the same pathways, if they so choose.

Framed around choice and agency, equal opportunity can be operationalized through both non-compensatory and compensatory ways (Espinoza, 2007). In a non-compensatory sense, equal opportunity emphasizes non-discrimination and universal access. In the context of STAs, this may look like ensuring STAs are available to all students regardless of socioeconomic status, major, or institution. In a compensatory sense, equal opportunity requires proactively counteracting historical disadvantages to broaden baccalaureate access for populations previously excluded from transfer pathways.

Equal Educational Outcomes

The second type of equality is *equal educational outcomes*, which argues the goal of public education should not be to provide equal opportunities, but rather ensure there is equality in students’ educational outcomes. This is because equal opportunity in the presence of unequal information and preparation produces and legitimates actual inequalities in education (Dougherty, 2024). Whereas equal opportunity emphasizes student choice and responsibility in taking advantage of opportunities, aiming for equality in educational outcomes emphasizes that not all students may be able to take advantage of the opportunities presented to them. Instead, this principle extends the responsibilities of the state: the state ought to ensure all students, regardless of social origin, actually benefit from the opportunities provided to them, as determined by measurable outcomes (Farrell, 2022). Thus, more so than equal opportunity, equal educational outcomes is compensatory in nature and promotes humane theories of justice, which

“focus on what we deserve simply because we are members of the human species” (Jencks, 1988, p. 521).

While evaluating whether a policy has promoted equal opportunity can be ambiguous and contested because opportunity is abstract and difficult to quantify, equality in educational outcomes can be determined with concrete measures. Thus, the word equity is primarily used to refer to this type of equality in recent times: to “attain equity” is to attain a state in which there is parity across socioeconomic groups for a particular measure, be it participation rates or pass rates (Marginson, 2011). Yet attaining equality in educational outcomes is much harder than promoting the absolute growth in participation rates of underserved populations. Thus, studies promoting the value of equality in educational outcomes may focus on gaps between social groups and examine whether observed gaps increase or decrease over time, or look to growth in participation of a social subgroup as an intermediary step and outcome of interest. This shifts the focus from providing the same opportunities to utilizing a differential distribution of opportunities and resources to accomplish the same levels of educational success.

In the context of STAs, equal educational outcomes would mean a policy is not judged by whether students have the same transfer pathways to choose from, but by whether students from different backgrounds actually achieve transfer-related outcomes at comparable rates (e.g., credit loss rates and transfer rates) or magnitudes (e.g., share of transfer students belonging to a specific social group is representative of their percentage in the broader student body or community) to their majority counterparts. Under such a principle, STAs would be a means to create parity or improve the success rates of students of a specific demographic that are underserved by other parts of the transfer process.

Equal Social Outcomes

The third type of equality is *equal social outcomes*, which derives from the idea that education is a vehicle of social mobility that should lead to comparable social outcomes. Here, the ideal is that “...children from various social groupings will live relatively similar lives subsequent to and as a result of schooling (have equal incomes, have jobs of roughly the same status, have equal access to sites of political power, etc.)” (Farrell, 2022, p. 172). In the context of STAs, having equal social outcomes as a principle entails expecting transfer policies to reduce inequalities in individuals' lives, or grant social mobility. The focus is not simply on whether students transfer or earn bachelor's degrees but whether those improved educational achievements lead to comparable economic, occupational, and civic outcomes regardless of students' social origins.

Table 1*Typology of Principles in Education Policy*

Concept	Principle	Keywords	Empirical Examples in the Context of Statewide Transfer Articulations
Efficiency	Productivity	increase rates	<i>Does degree attainment increase after STA enactment?</i>
	Cost Reduction	credit (loss), accelerate	<i>Do students under STA policies transfer/graduate faster?</i>
Equality	Equality in Educational Opportunity	choice, expanding access	<i>What are ways in which STAs pose unequal barriers to certain student groups?</i>
	Equality in Educational Outcomes	close gaps	<i>Do STAs reduce outcome gaps between transfer students and non-transfer students at four-year universities?/between different socioeconomic groups?</i>
	Equality in Social Outcomes	social mobility, earnings	<i>What are the labor market outcomes of students under STAs in comparison to those without?</i>

Table 1 summarizes these principles of efficiency and equality, alongside empirical examples of examining these objectives in the context of higher education transfer and STAs. Policy objectives with efficiency orientations aim to improve systems from before, emphasizing technical elements of the transfer system. This is empirically assessed through a comparison between the transfer student population (i.e., the primary constituents of STAs) before and after policy enactment, or in states with and without STAs. On the other hand, those with an equality orientation focus on the social role of the transfer system and are concerned with mitigating differences between more or less disadvantaged groups. This can involve investigating whether certain transfer programs are only available to a privileged student group (i.e., equal opportunity

among transfer students) making comparisons between students who transfer vertically from community colleges and those who are ‘native’ non-transfer students at four-year institutions (i.e., equal opportunity between transfer and non-transfer students), or examining outcome gaps between transfer students of different socioeconomic backgrounds (i.e., equal educational outcomes among transfer students). Because these four principles are not mutually exclusive, empirical studies could evoke multiple orientations in the motivations of their study or employ multiple lines of inquiry.

Conceptual Framework and Research Questions

This study presents a bifocal (Young, 1999) review of the literature on STAs by using two distinct theoretical frames for analysis: traditional policy analysis and a critical policy analysis informed by Victor Ray’s Theory of Racialized Organizations (TRO) applied to community colleges (McCambly et al., 2023; Ray, 2019). For the purposes of this review, the traditional frame is concerned with systematically reviewing methods and findings of the empirical literature on STAs, while the critical frame is concerned with the difference between rhetoric and the practiced reality of policy research within the same body of literature (Diem et al., 2019).

The typology represented by Table 1 is used to answer the first research question: *What policy objectives and principles motivate empirical research on STAs?* The two analytic frames, in turn, allow the findings to be presented holistically and then interpreted critically. The findings for the second research question are reported through the traditional frame: *What empirical approaches, outcomes, and findings characterize the literature on STAs?* The critical frame interprets the findings from the first and second research questions to answer the final research question: *To what extent do the empirical approaches and outcomes examined align with the*

policy objectives and principles that motivate research on STAs? In the remainder of this section, I first elaborate on the value of employing a bifocal synthesis and then apply the concept of community colleges as racialized organizations, which serves as the critical frame for this study, onto the context of STAs.

A Bifocal Synthesis of Policy Research

Traditional policy analysis approaches tend to treat policy as “a deliberate, linear process where an identifiable set of actors apply reason and research strategies to ensure the best policy outcomes” and frames research behavior as a rational weighing of costs, benefits, and outcomes of a given action (Diem et al., 2019, p. 4). Put together, most policy analyses of STAs would be expected to emphasize the measurement of precise outcomes (e.g., credits or number of students who transfer) and the technical function of STAs (i.e. credit transfer). By extension, a traditional frame to synthesizing policy research would also focus on reporting overall findings of the literature to identify a holistic picture of “what works” (i.e., the conditions under which STAs seem to achieve desired outcomes).

In addition to a traditional frame, this review uses a critical frame to synthesize the STA research. Critical policy analyses employ theoretical frameworks to examine issues such as the difference between policy rhetoric and practiced reality, the roots and development of policy, the distribution of power and resources, how policy reproduces or challenges inequities, and how non-dominant groups resist processes of domination and oppression (Diem et al., 2014; Young, 1999). Using the theory of racialized organizations as a lens, this review examines the relationship between the policy rhetoric that motivates studies on STAs and the employed research methods to study them. By having a bifocal approach to synthesizing the empirical literature on STAs, the following review aims to not only summarize findings of the body of

research, but also examine how framings around STAs have changed over the past decades and how closely empirical studies align with what is espoused.

Community Colleges as Racialized Organizations

According to TRO, organizations play a large part in the social construction of race: racial schemas in society and state policy are mediated and reinforced by resources and routines at the organizational level (Ray, 2019). One major tenet of TRO is that racialized organizations limit the personal agency and collective efficacy of oppressed racial groups while magnifying the agency of oppressors. In an educational context, this would suggest racialized organizations perpetuate inequalities in educational opportunities and outcomes.

McCambly et al. (2023) apply this tenet to the context of community colleges and posit that racialization occurs for community colleges through the reduction of their social role and value. Although community colleges serve a diverse population of students and a diverse set of missions and educational pathways, “practically all major top-down community college reform movements ... over the last two decades have focused on workforce returns or narrowing student pathways to and through community college ... reducing the student experience at community colleges (McCambly et al., 2023, p. 663).” STA discourse provides one potential example of this narrowing. Scholars have noted that, as state involvement in transfer articulation has increased, the purposes attributed to articulation have increasingly been on enhancing transfer efficiency and preventing credit loss (Giani, 2019; Roksa & Keith, 2008; Taylor & Jain, 2017; Kisker et al., 2012). While efficiency-oriented objectives can be concerned with reducing costs for students, efficiency in and of itself represents a set of values that are distinct from objectives concerned with educational equality. An emphasis on efficiency may, therefore, privilege particular understandings of what transfer systems are intended to accomplish while making other purposes

and outcomes less visible. As states increasingly incorporate particular measures of transfer success into community college accountability systems, the debate over what constitutes successful transfer is not only an academic but also a political issue (Roksa, 2009).

The conceptualization of community colleges as racialized organizations informed the critical policy analysis of this review. Specifically, I examined whether the literature on STAs reflects the organizational dynamics predicted by TRO, that the policy rhetoric surrounding STAs privileges dominant student groups and minimizes the role of community colleges by focusing on principles of efficiency. In practice, I interrogated whether the majority of the literature utilizes race-neutral language to describe policy effects, minimizing or omitting consideration of the marginalized status of community colleges within the larger higher education system or marginalized student groups within community colleges. I also examined the extent to which racialized organizations—community colleges—and a distinct family of policies that concern them—STAs—are motivated and empirically examined with the principle of efficiency. This would mean (a) the majority of studies will be motivated by efficiency, and (b) regardless of how studies were motivated, the empirical approaches would align with examining measures of efficiency rather than equality.

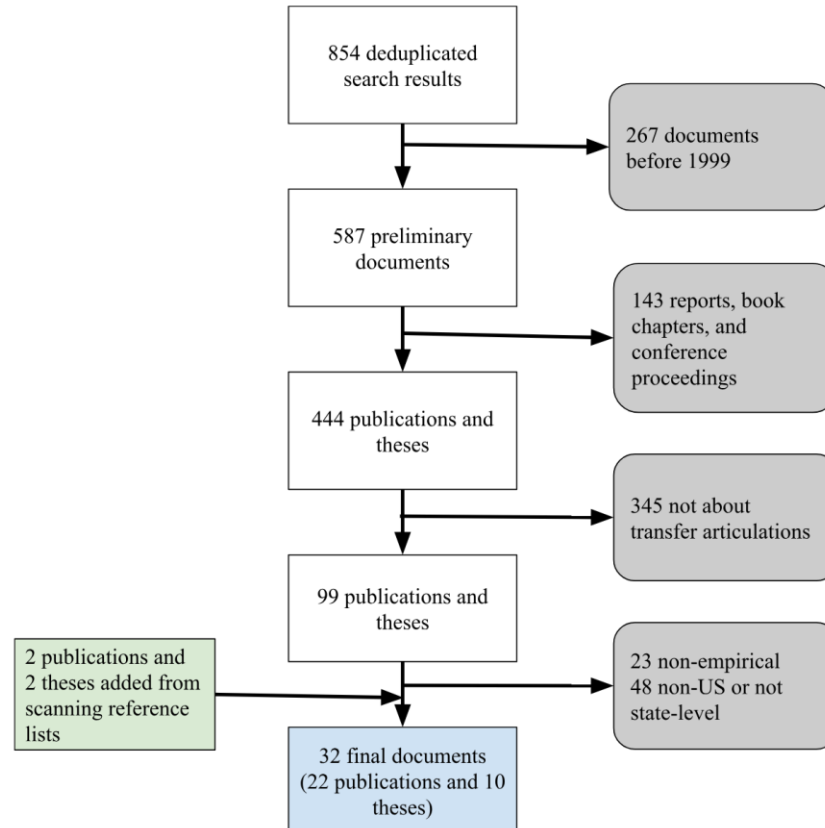
Methods

This systematic review was conducted with reference to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. The educational research database, Education Resources Information Center (ERIC), was used to conduct a keyword search in July 2024. ERIC was the database of choice because filtering for scholarly articles is more tractable by focusing solely on education-related work. More expansive databases such as Google Scholar were not used because Google Scholar's constantly-changing algorithm and

structure does not allow for systematic searches and replicability (Giustini & Kamel Boulos, 2013). Queries combined keywords from different categories: evaluation-related terms (“impact”, “evaluat*”, “implement*”, “assess*”), a state-level term (“state*”), transfer-related terms (“transfer”, “community college”), and policy-related terms (“articulation”, “polic*”). All of the possible keyword searches and combinations used are included in Table S1. Potential error was further mitigated through a scan of the reference lists of the final articles for additional articles that did not appear from the database searches. This process yielded an additional two journal articles and two dissertations. The complete article selection process is illustrated by Figure 1. In the following section, I outline the inclusion-exclusion process and subsequent analysis.

Figure 1

PRISMA Diagram for Filtered Articles



Inclusion-Exclusion Criteria

From an initial spreadsheet of 854 deduplicated articles, I evaluated whether each article in the list met the criteria for inclusion based on the content of the titles and abstracts. Final decisions for inclusion were corroborated by a colleague and group of research assistants. All inclusion-exclusion criteria are listed in Table 2.

Table 2

Inclusion-Exclusion Criteria

Criteria	Include	Exclude	Rationale
Language	In English	Non-English articles	Authors' ability to analyze the content
Year	Published 1999–2024	Articles published in 1998 or earlier	To review the last 25 years since increased involvement of state governments in college transfer (Kintzer, 1996)
Scope of Setting	<ul style="list-style-type: none"> - Studies in the US higher education context - Studies on state-level transfer articulations 	<ul style="list-style-type: none"> - Articles outside of a higher education setting - Studies on articulations for transfer that is not within-state or vertical - Studies outside the U.S. 	<ul style="list-style-type: none"> - The study purpose is to survey the empirical research that has been conducted on STAs - Although STAs impact non-vertical transfer, the study is concerned with how vertical transfer is framed within the policy context - Although there may be cases of similar policies outside of the U.S., the higher education context in each country is unique, and we want to ensure the findings are relatively comparable
Publication Types	Peer-reviewed journal articles OR doctoral theses (i.e. dissertations)	Other publication types such as policy briefs, news articles, and books	<ul style="list-style-type: none"> - Purpose of the study is to review the focus and direction of the scholarly work on STAs and not conduct assessments on research rigor or quality - Not all policy briefs and books highlight the methodology of the research - Feasibility
Study design	Empirical (qualitative, quantitative, and mixed-methods) papers of STAs	<ul style="list-style-type: none"> - Articles that do not examine how STAs are implemented or the outcomes of an STA - Theoretical or discussion articles 	The purpose of the study is to examine the theoretical frameworks grounding the empirical research that has been conducted on the effects and implementation of STAs, and is not meant to include studies that do not directly consider STAs as a factor.

Database selection	ERIC	Other databases	Using ERIC makes filtering for scholarly articles more tractable by focusing solely on education-related work and allows for replicability of searches
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Overall, 267 documents published before 1999 were excluded for modernity. A formal assessment of the quality of the included articles was not conducted due to the study's focus on description and narrative. However, because the study investigates the empirical methods employed by each study, publications at minimum must have had explicit research questions and transparent empirical methods. For instance, 143 pieces of gray literature such as policy briefs were excluded from this review due to the broad range of formats and intended audiences that result in omission of elements this study is interested in. In addition, 345 articles were excluded because transfer articulation was not the primary focus of the study. This included articles that mentioned transfer articulation only as background or contextual information without empirically examining policy and practice itself through a form of policy evaluation, document analysis, or implementation research. Of the 99 remaining articles referring to transfer articulation, 23 were excluded for being literature reviews or lacking empirical elements such as clear research methods or research questions, and 48 articles were eliminated for either being outside of the U.S. or concerning articulations that are not statewide (e.g., case studies of unique partnerships between two institutions). This review focuses on statewide articulations because their state-level governance provides a common policy context for comparing research across studies. STAs apply across multiple institutions and are often studied through comparisons across states or over time, creating a common basis for examining how researchers define policy objectives, select empirical methods, and assess policy outcomes. Doctoral dissertations were included because they are indexed and less prone to publication bias but still intended for an academic audience,

filling gaps that exist in the published literature (Adams et al., 2017; Haddaway et al., 2020) and making up one third of the existing scholarship. The final body of literature totaled 32 documents that comprise 22 journal articles and 10 theses. The complete list of articles is listed in Table S2.

Analysis

Thematic coding (Maxwell, 2013) of all 32 documents was conducted using the software MAXQDA. Coding began with a set of deductive codes reflective of the research questions and policy principles outlined in Table 1. Additional inductive codes and child codes were created to further differentiate themes. To reduce bias and ensure consistency in the coding process, a colleague and I independently coded an initial subset of articles ($n = 3$) and compared results to assess agreement, discuss emerging themes, and resolve discrepancies. After coding all 32 documents, I reexamined each group of text segments attributed to each code to ensure consistency in how each code was used. The full list of codes are listed in Table S3.

To identify the policy objectives and principles driving the empirical research on STAs, I first read through each article's structure and coded for segments that motivated the empirical studies. Some studies referred to relevant theories by implicitly positioning them as theories to test, and therefore taking on a tone of traditional empiricism. These segments were coded as "Formal Theory." For example, Baker (2016) says that according to human capital theory, "students will continue in higher education until the perceived costs exceed the discounted perceived long-term benefits" (p. 627) and uses the introduction of an STA as an instance in which the cost of enrollment in higher education may be reduced. Doing so also treats the theory of action of the study's STA to be improving degree attainment and transfer rates through improving efficiency (i.e. reducing costs) for students, and frames student enrollment behavior as an individual investment with economic returns. In one study, Spencer (2019) cites the

effectiveness of “nudging” on desired student behavior and outcomes documented in behavioral economics. He then refers to transfer assurance guides, a form of STA in Ohio, as an instance of “nudges” to be tested. Other papers referred to frameworks to introduce their analytical lens or method, such as structural and cultural contestations in policy implementation (Felix, 2018), critical policy analysis (Chase, 2011; Chase et al., 2014; Worsham, Whatley, et al., 2021), and the potential outcomes framework (Crosta, 2013). These segments were coded as “Analytic Framework” and further divided into “Given Framework” or “Generated Framework” depending on whether the framework derived from disciplinary norms or existing literature, or emerged as a result of the study’s analysis.

Using the typology outlined in Table 1, I then coded the studies based on how the studies referred to the purpose or function of STAs. Importantly, the coding captures the principles invoked in the text, regardless of whether authors explicitly endorsed them. Accordingly, a segment was coded as a type of efficiency or equality when it attributed that principle to STAs, even if the author presented it critically, descriptively, or as an empirical proposition rather than as a desired policy objective.

In addition to the policy principles used to characterize STAs, I also coded for how community colleges and students were characterized. This process revealed two different ways studies define disadvantage when appealing to notions of equality: (a) disadvantage as a characteristic of the populations served by community colleges, and (b) disadvantage as a condition produced by the transfer system itself (i.e., all community college students, regardless of socioeconomic background, are disadvantaged because they face an inefficient transfer system).

In order to account for the extent of race-neutrality in policy language, I coded studies that explicitly referenced race or class in the discussion of STAs with the code, “Race and Class.” Thirteen of the 23 studies that evoked a principle of equality explicitly mentioned race, class, or both. In addition, a large portion of studies recognized the significance of the community college system serving students who may not otherwise have access to higher education. These studies emphasized community colleges’ role in democratizing higher education through their relative affordability, open-access admissions, and geographic accessibility, particularly for low-income, first-generation, racial-ethnic minority, rural, and non-traditional age students (Garcia Falconetti, 2009; Stern, 2016; Worsham, DeSantis, et al., 2021). However, this recognition of community colleges’ role in advancing educational equality did not necessarily extend to how studies characterized STA policies and programs. I therefore created a separate code, “CCs Serve Minorities,” to distinguish these references from statements about the equality-related objectives of STAs themselves.

To answer the second research question, I coded each study’s research methods, population of interest, outcome of interest, and, where applicable, the groups being compared. The comparison groups are particularly important for answering questions of equality: equality necessarily raises the questions of “equality for whom” and “relative to whom,” yet these questions are not always made explicit in empirical research.

To answer the final research question, I examined whether the empirical approaches and outcomes examined in the STA research aligned with the principles present in the studies’ motivations. For example, I examined whether studies that did not invoke notions of equality (or invoked equality without reference to race, class, or the democratizing role of community colleges), compared outcomes between transfer and non-transfer students. This is because a race-neutral

framing of STAs and inefficiencies of the transfer system lends itself to conceptualizing all transfer students as disadvantaged relative to students who begin at four-year institutions, rather than locating disadvantage within particular racial or socioeconomic groups. On the contrary, only four of 32 studies drew comparisons between transfer and non-transfer students, and three of these studies invoked equality.

I also examined whether studies that explicitly named disadvantaged and marginalized student populations in their motivation for studying STAs also treated these populations as populations of analytical interest in their empirical analyses. This included examining barriers to access, disaggregating findings by student subgroups, comparing outcomes between privileged and disadvantaged populations, or intentionally selecting settings or experiences involving marginalized populations. Studies that treated race or other demographic characteristics as merely covariates to control for were excluded from this categorization because doing so aggregates all students into a single pool to estimate an average policy effect.

Findings

This section outlines the primary themes that emerged from the review, organized sequentially by research question: the policy objectives and principles motivating the literature, the empirical methods employed and findings of the literature, and the alignment between these conceptual and empirical domains.

The Divide between Equal Opportunity and Equal Educational Outcomes

Overall, the studies on STAs could be separated into those that exclusively referenced efficiency and those that also referenced some type of equality, be it equal educational opportunities, equal educational outcomes, or equal social outcomes.

Figure 2

Venn Diagram of Number of Publications and Theses Evoking Each Policy Principle

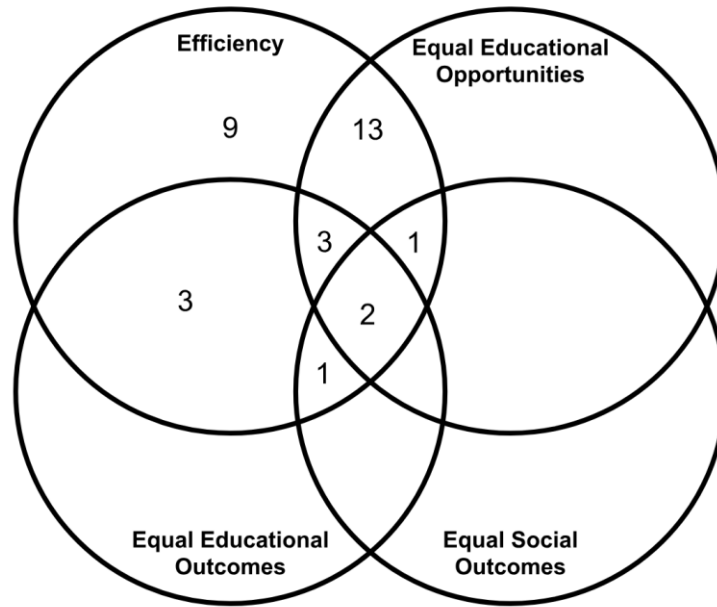


Figure 2 presents a Venn diagram of the number of studies that included language of each orientation. The prior category contained nine articles, all of which were quantitative studies, while the latter contained 23. All studies used efficiency-oriented language regarding STAs, with the most prevalent being degree productivity and credit loss. This was not surprising because articulations themselves, as examined by Roksa and Keith (2008), are primarily concerned with credit loss. Consequently, most studies defined STAs in terms of technical functions, often citing this seminal study. In contrast, 19 of the studies referred to STAs in light of how they may impact equality in educational opportunity, nine referred to equality in educational outcomes, and four referred to equality of social outcomes. Only half of the studies referring to equal educational outcomes also referred to equal educational opportunity, suggesting a partial but not complete divide between the two types of equality-oriented language evoked in educational policy.

The Characterization of Community Colleges and Invisibility of Students

Unsurprisingly, studies that used both principles of efficiency and equality were more likely to mention community colleges' role in serving marginalized students or the role of race and class, than those that only used efficiency orientations.

Table 3

Principles Used to Characterize STAs and Reference to Disadvantaged Students

Coded with “Race and Class” or “CCs Serve Minorities”	Efficiency		Efficiency and Equality	
	Yes	No	Yes	No
Count (n)	4	5	18	5

Table 3 summarizes the number of studies that were coded with either “Race and Class” and “CCs Serve Minorities” amongst the studies that did or did not evoke principles of equality. The studies in the first and third columns posit STAs as impacting disadvantaged students who intend to transfer. In contrast, the second and fourth columns indicate studies that positioned transfer students as a disadvantaged group relative to non-transfer students, while nevertheless remaining largely race- and class-neutral in their characterization of who is disadvantaged. Overall, 27 of the 32 articles mentioned STAs either (a) may/should further educational equality for disadvantaged or minoritized students or (b) impact community college students, many of whom are underrepresented or disadvantaged in higher education. That the studies pertaining to the fourth column of Table 3 make reference to STAs' role in furthering equality without reference to the populations community colleges serve points to how policy discourse can invoke the problem of educational inequality while still rendering the racialized distribution of that inequality invisible.

Summary of the Methods and Outcomes of Interest

Figure 3 reports the research methods of studies over time. Twenty one studies used quantitative methods, seven studies used qualitative, and four studies were multi-method studies that used both quantitative and qualitative methods. The most recent studies were overwhelmingly quantitative studies, using causal inferential methods such as propensity score matching (Spencer, 2021) and difference-in-differences (Baker et al., 2023; King, 2019; Spencer, 2019a, 2019b; Worsham, DeSantis, et al., 2021; Worsham, Whatley, et al., 2021). A closer breakdown of the methods are provided in Table 4.

Figure 3

Research Methods Over Time

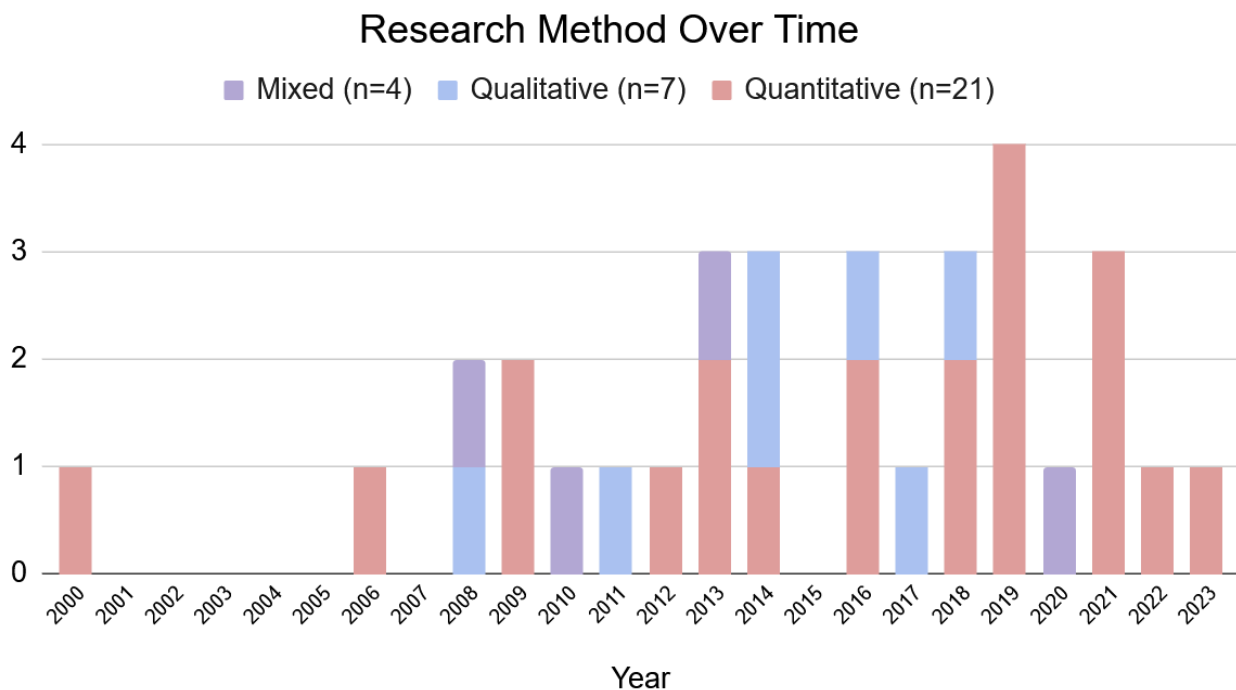
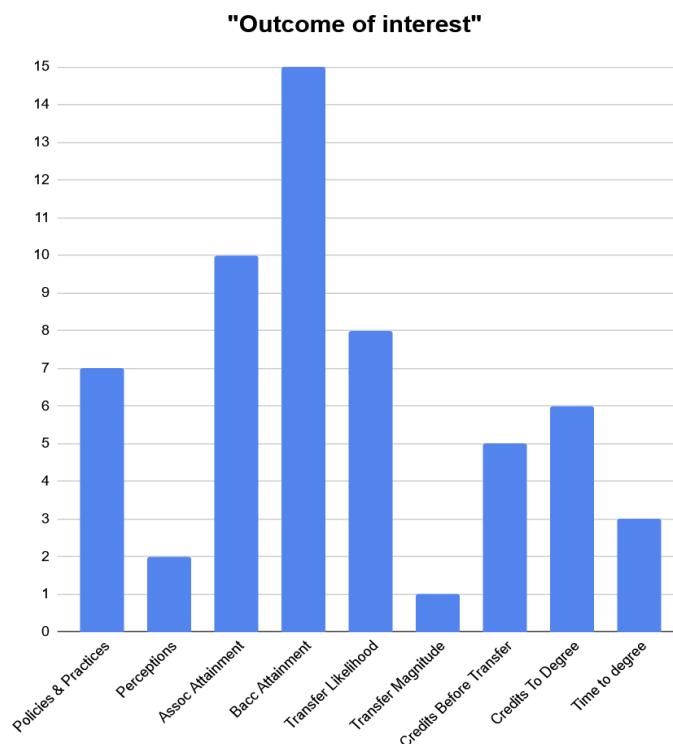


Table 4*Research Methods Used*

Quantitative	Count (n)	Qualitative	Count (n)
Survey	3	Interview	6
Chi-Squared	3	Document analysis	6
ANOVA	3	Compressed ethnography	1
Linear Regression	3		
Logistic Regression	8		
Hierarchical Linear Modeling	2		
Difference-in-Differences	8		

*multi-method studies were counted multiple times

Figure 4*Types of Study Topics (i.e. Outcome of Interest)*

Although degree attainment was the most popular, the literature examined a broad range of outcomes. Figure 4 illustrates the distribution of different outcomes of interest. The most commonly examined outcome was baccalaureate degree attainment, with 15 of 32 articles, followed by the associates degree attainment in 10 articles, and transfer likelihood in eight articles. Most quantitative studies used two or more of these outcomes of interest. Less common outcomes were time to degree and credit accumulation before transfer. Only a few studies, such as by Baker (2016) and Worsham, Whatley, et al. (2021), explicitly disaggregated outcomes by race. Such analyses make it possible to examine whether the effects of STAs vary across student populations, rather than treating the overall effect as necessarily representative of all students. Quantitative studies reported inconclusiveness in whether STAs were effective in promoting similar outcomes for different demographic groups, across the many different outcomes examined.

Qualitative Studies: From Documents to Implementation

The subject and outcomes of interest of quantitative research on STAs has not largely changed, while those of qualitative research has. Whereas earlier qualitative studies utilized document analysis to provide overviews of characteristics of STAs, recent studies have focused on the implementation of STAs in local contexts to shed light on how challenges and complications emerge in the policy implementation process (Felix, 2018; Grote et al., 2020; Hodara et al., 2017). In these qualitative studies, the structure of transfer systems—centralized versus decentralized—emerges as a critical mechanism influencing student outcomes. Centralized systems, which standardize policies and pathways across institutions within a state, are often associated with higher rates of transfer and degree completion. Garcia Falconetti's (2008) case study of Florida's decentralized transfer system illustrates the challenges that arise when institutions lack clear, consistent policies. In contrast, states with more centralized systems

tend to exhibit more predictable and positive outcomes for students. Guided pathways and effective advising are also emphasized as crucial components of successful transfer processes. Studies by Felix (2018) and Hodara et al. (2017) highlight the importance of clear communication and accurate advising in helping students make informed decisions about their course selections and transfer options. These studies suggest that when students receive adequate support, they are more likely to achieve their educational goals and experience fewer barriers during the transfer process.

Quantitative Studies: Five Different Comparison Groups

All quantitative studies employed comparison groups to contextualize observations, but the underlying frameworks informing what groups are used as baselines varied greatly. As outlined in Table 5, studies drew comparisons along five major axes: (a) transfer students and non-transfer students, (b) states with and without STAs, (c) transfer students who transferred with and without a specific STA, (d) before and after policy enactment, and (e) between community college or transfer student subgroups under the same STA.

Table 5*Comparison Groups of Quantitative STA Studies*

Comparison Groups	Description	Example	Count (n)
Transfer Students vs. Non-transfer Students	Comparing outcomes between transfer students and non-transfer students	Number of credits excess of graduation minimum (Garcia Falconetti, 2009); baccalaureate degree attainment and time to degree (Madison, 2022; Smith, 2014)	4
States with STAs vs. States without STAs	Comparing outcomes between states with or without an STA	Likelihood of community college enrollees transferring (LaSota, 2013); growth in degree attainment rates (Stern, 2016)	6
Transfer Students with vs. Transfer Students without STA	Comparing outcomes between students who transferred with or without an STA	Those who did and did not participate in STA programs from the same community college (Worsham, DeSantis, et al., 2021)	7
Before vs. After policy Enactment	Comparing rates before and after policy enactment	Differences-in-differences approaches (Baker, 2016; Baker et al., 2023; Spencer, 2019a, 2019b)	8
Subgroups	Comparisons among different kinds of student subgroups	First-time enrolled and returning students (Spencer, 2019a); low-income students (King, 2019); racial minorities (Worsham, Whatley, et al., 2021)	5

By mapping the distinct comparison group configurations across this body of literature, this study underscores the necessity for scholars to exercise caution when comparing empirical findings across disparate research designs. Ultimately, how researchers structure their comparison group implicitly defines the standard by which parity or equity may be assessed for evaluating policy effectiveness. Studies comparing transfer students to native non-transfer students operate on the assumption that post-transfer parity is the ultimate goal. Conversely,

studies comparing transfer students who did and did not utilize an STA position policy success as incremental improvement in transfer efficiency relative to historical or non-participating baselines.

Among the 21 quantitative studies, the most common approach was evaluating outcomes of interest before and after STA enactment. These studies typically used differences-in-differences designs, combining temporal comparisons with an additional institutional or demographic control listed in Table 5. For example, Worsham, Whatley, et al., (2021) compared changes to two-year completion rates post-transfer between different racial groups (Black, Latinx, and White) before and after policy enactment and found the policy increased how long baccalaureate completers took to graduate, but the size of the impact and change over time varied between the three student subgroups. Most studies comparing across states with and without STAs were dissertation theses, which may have been due to difficulty acquiring individual-level datasets.

Studies Invoking Equal Educational Outcomes are Most Consistent

Figure 5 illustrates the extent of alignment across different groups of studies, divided by the policy principles used to motivate the studies. Among the nine studies that only used efficiency-oriented language when referring to the purpose and value of STAs, none examined disadvantaged or minoritized populations as a population of analytical interest, despite four of the nine studies having referred to these populations when motivating the study.

Figure 5

Studies Referencing STAs for Equality for Disadvantaged Students vs. Systemic Efficiency

	Frames STAs as (a) for educational equality for disadvantaged or minoritized students OR (b) impacting community college students (many of whom are disadvantaged)	Empirically examined disadvantaged or minoritized populations as a population of analytical interest
Principles Used		
Efficiency Only	4/9	0/9
Efficiency + Equality	18/23	14/23
Equal Educational Opportunity	14/19	6/19
Equal Educational Outcome	9/9	6/9

Studies that motivated both principles of efficiency and equality were more likely to have empirical designs that examined the populations they identified when motivating STAs. Disaggregating between the different types of equality revealed that the relative consistency observed in the studies that use both efficiency and equality is driven by studies that refer both to equal educational opportunity and equal educational outcomes; studies that reference equal educational outcomes were more consistent than studies that reference equal educational opportunity, but the most consistent were those that invoked both principles.

The Replacement of Credit Loss with Credit Accrual

Notably, despite the frequent use of credit loss to frame STAs as a response to the dire issue of systemic inefficiency, no study directly measured credit loss. This is likely because

identifying the exact number of credits a student attempts to transfer versus the number of credits that were actually transferred would be challenging. Instead, studies examined measures such as credits accrued before transfer or total credits earned by the time of baccalaureate degree attainment. In these analyses, credit accrual was generally treated as negative because it suggested that students were enrolled for longer periods of time. Yet greater credit accumulation could also be the expected outcome of a policy that successfully prevents credit loss: if students are able to transfer all of their coursework (i.e., experience no credit loss), they would ultimately earn more of their credits toward a degree. As Roksa and Keith (2008) noted, the original stated goal of STAs was technically to prevent credit loss, not encourage vertical transfer. Thus, the evaluation of STAs appears to have shifted from asking whether students lose credits to asking whether students can complete their degrees with fewer total credits. Credit loss in and of itself may not be a practical concern for studies on STAs as much as the efficiency-oriented purpose behind mitigating credit loss—ensuring students do not have to retake courses at new institutions so that they graduate faster.

Discussion

Overall, the findings suggest that efficiency is taken for granted in the STA research, being invoked in each empirical study. However, future research must critically reexamine how efficiency is operationalized. Although credit loss is the central efficiency justification for STAs, no reviewed study directly measured credit loss. Instead, studies used proxies such as total credit accrual or time to degree completion. Consequently, high credit accumulation could be interpreted as evidence of policy failure or inefficiency. This potentially contradicts the original value that motivated the establishment of articulations: retaining credit for courses taken (Roksa & Keith, 2008). If STAs successfully preserve credit transferability, students should retain and

accumulate more credits toward their degrees. Framing credits that do not directly apply to degree completion strictly as waste also overlooks the intentional contexts in which transfer students navigate course enrollment. (Kolby, 2026).

At the same time, the STA literature frequently invokes equality without consistently specifying what equality means, or for whom it is being examined. Most studies that used equality-oriented language described community colleges as expanding access for students who have historically faced barriers to four-year education, yet some framed disadvantage as a characteristic of particular racial or socioeconomic populations, while others implied all transfer students were disadvantaged relative to students who begin at four-year institutions. These framings have different implications: the latter can invoke educational inequality while remaining race- and class-neutral, effectively shifting attention from the unequal distribution of disadvantage to the inefficiency of the transfer pathway itself. The result is a literature in which inequality can be presented as a rationale for studying STAs without necessarily making the populations experiencing that inequality visible as objects of analysis.

Ultimately, framing influences what becomes empirically visible. Studies that invoked equality alongside efficiency exhibited greater alignment between their motivating principles and empirical designs, particularly when they invoked both the principles of equal educational opportunity and equal educational outcomes. The stronger alignment in studies invoking the principle of equal educational outcomes may reflect the fact that focusing on outcomes directly raises questions about who benefits from a policy in measurable ways. More broadly, these findings suggest that different policy principles do not simply explain why researchers study STAs, but also shape which populations, outcomes, and disparities become empirical objects of inquiry.

Taken together, these findings complicate the question of whether STAs “work.” Effectiveness is not a neutral empirical question because evaluative metrics and comparison group configurations carry implicit theories of policy success. A study comparing transfer students with native four-year entrants tests for parity across educational pathways, whereas a study comparing outcomes before and after a policy is implemented evaluates improvement relative to a prior baseline. If STAs are justified as both efficiency-enhancing and equity-promoting policies, then evaluating their effectiveness requires specifying not only whether transfer and degree attainment improve, but for whom, relative to whom, and at what cost.

This systematic review has two primary limitations. First, the search protocol was restricted to peer-reviewed empirical studies, excluding policy reports, institutional briefs, and other gray literature. While this ensured a baseline of rigorous peer review, it may miss how research is motivated differently across academic and practitioner-focused venues. Second, this review focused strictly on policy principles of efficiency and equality. Other principles such as *equal educational quality* (e.g., curricular rigor, pedagogical depth, and institutional resource parity) were not incorporated into the primary coding framework. While this dimension was excluded because it was absent from the empirical STA literature reviewed, educational quality constitutes a critical pillar of higher education policy evaluation, and future syntheses of education policy research should consider expanding this typology to include this.

Implications for Policy, Practice, and Research

From a policy perspective, state legislators and higher education governing boards must explicitly clarify whether an STA aims to achieve absolute demographic parity, expand system-wide transfer volume, or accelerate degree velocity. Disentangling efficiency goals (e.g., credit preservation) from equity goals (e.g., closing subgroup outcome gaps) prevents misaligned

policy expectations and evaluative benchmarks. Furthermore, state-level credit audits must distinguish between redundant coursework caused by articulation failures and intentional credit accumulation so that policies do not inadvertently penalize institutions when students intentionally explore coursework outside of what may lead to the fastest path to a degree.

In terms of institutional practice, college administrators, transfer advisors, and institutional researchers must move away from treating transfer students as a monolithic or universally disadvantaged cohort. Disaggregating transfer, retention, and completion metrics by race, ethnicity, and socioeconomic status is essential for identifying where structural barriers persist. Additionally, while qualitative evidence suggests centralized state systems provide clearer articulation pathways than decentralized ones, structural policy alone is insufficient. Campus practitioners must pair state transfer agreements with proactive guided pathways and holistic advising tailored to the specific needs of historically minoritized student populations.

Finally, for future research, empirical scholars must exercise greater methodological transparency when constructing control and baseline groups. Researchers should explicitly articulate whether their analytical designs test for post-transfer parity with native students, historical incremental progress, or subgroup equity, as these choices carry distinct implicit theories of policy success. Methodologically, quantitative scholars should also seek to use datasets that directly capture credit applicability to compare attempted, articulated, and degree-applicable credits, rather than relying on overall credit accrual as an inverse proxy for efficiency in credit transfer.

Conclusion

This systematic review illustrates that the literature on STAs is anchored by an implicit consensus around efficiency, but divided in its conceptualization and empirical treatment of

equality. While STAs are commonly understood as a multi-purpose means to improve credit mobility and broaden educational access, empirical evaluations often decouple these objectives. By mapping how research motivations, outcome selections, and comparison group choices shape empirical findings, this study demonstrates that policy research is fundamentally value-laden. Advancing the transfer literature to inform positive changes to systems requires scholars and policymakers alike to move beyond asking whether transfer policies “work” in the abstract, and toward explicitly defining the principles of equality, efficiency, and fairness that guide their analytical approaches.

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