

Analysis on Content-Based Instruction Methods Influencing Student Outcomes in Higher Education

Jason J. Sibulkin

School of Economics and Management, Huizhou University, Huizhou, China

Email: Jason@hzu.edu.cn

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Abstract

This systematic review examines the current literature on CBI (Content-based Instruction) methods and summarizes the data as it relates to influencing ESL student outcomes in Higher Education. The international tertiary community continues to experience a substantial growth in ESL students, which represent a significant portion of total enrollment. To meet this demand for bilingual education EAP (English for Academic Purpose) programs such as CBI curriculum have been widely adopted as the preferred pedagogical approach to address this growing trend in higher education. Despite this popularity, there is a lack of longitudinal research on the efficacy of CBI courses that link this approach to sustained improvement on student academic achievement scores. The findings reviewed herein suggest a positive sustained relationship between CBI curriculum and increased academic performance post intervention. The results of this investigative effort also support the seminal literature, which indicates the majority of participants consider CBI methods as a suitable pedagogical technique to acquire language and content knowledge, while enhancing long-term academic achievement. This research may inform future practitioners, administrators, and policy makers in the development of ESL programs in the tertiary community.

Keywords

CBI, Intervention, Higher Education, Long-Term, Achievement, Bilingualism

1. Introduction to CBI and Bilingualism

Historically bilingualism has been favored among educators and students dating back to ancient Sumeria; however, not until the late twentieth century did institu-

tions of higher education begin to offer learning in a second language for ESL students [1]. In contemporary education, there continues to be a heavy demand on ESL programs that facilitate L2 (second language) learning through English for Academic Purpose (EAP) models; often, one of the three approaches to Content-based Instruction (CBI) is deployed as a popular option to learn content in the target language. According to [2] [3] [4], statistics from around the world continue to demonstrate a spike in ESL enrollment at credit-bearing higher education institutions. This presents a specific and immeasurable challenge for educators, where the goal is to quickly and effectively transition ESL students into the mainstream curriculum. Essentially, this was in response to a growing population of English Language Learners (ELL's) in the global higher education community, based on internationalization, and driven by global competitiveness [5].

1.1. Significance of the Problem

Despite the overwhelming popularity with CBI methodology in K-12, this approach to ESL instruction is increasingly met with skepticism in higher education. In the last decade numerous studies have produced mounting evidence, which indicates that content-based instruction consistently improves academic achievement, content knowledge, and acquisition of a second language, hereby referred to as L2 [3] [6] [7]. However, as evident by a recent study from [8], preliminary findings illustrate a trend in CBI methods which suggests a positive link between ESL students receiving content-linked language instruction, and the ability of these courses to influence academic achievement. Consequently, many scholars and administrative leaders in higher education cite a lack of longitudinal evidence to connect a student's improved academic achievement, as a direct result of CBI interventions [1] [9] [10]. To address this shortage of longitudinal data, and in response to the demand for effective ESL programs in post-secondary institutions, this systematic analysis of contemporaneous literature aims to create awareness of the known influence that CBI interventions have on a students' long-term academic achievement.

1.2. Purpose of the Analysis

The objective of this systematic review is to establish a theme within modern research that establishes a common relationship between CBI methods, and the perceived benefits of this approach on academic achievement among students in higher education. In a subordinate capacity, this research analysis will focus on content-based instruction, and the efficacy of this approach on ESL students learning in their L2, as a viable medium in promoting enhanced content and linguistic cognition, by comparing longitudinal data compiled from several studies. As a result, this review will explore various student and faculty perspectives towards CBI methods, and the ability of these ESL programs to influence and sustain enhanced achievement over an extended academic period. To facilitate this systematic review and explore the phenomenon, several studies were con-

sulted to determine if a positive relationship exists between students receiving CBI interventions, as compared to their peers in the control group. To understand the student and faculty perspectives, this analysis considers scholarly research utilizing mixed-methods and singular design formats.

The significance of this review and analysis is predicated upon the need for longitudinal data comparison, which addresses the scarcity of available research on the efficacy of CBI methods, and the perceived benefits this ESL pedagogy has to influence student academic achievement using a linear model. The acquisition of knowledge through this protocol will reveal influential factors regarding the efficacy of CBI, such as: student and faculty perspectives, graduation and retention ratios, pass rates, and overall long-term academic success.

This current study also contributes to a wider scope of research on CBI methods in higher education; in particular, it underscores associated relationships between this pedagogical approach and student outcomes. Essentially, the results outlined in this systematic review may be used in developing CBI programs in tertiary institutions directly within Asia, and to a greater extent, the global tertiary community. Additionally, this data may hold evidence suggesting a positive trend among students receiving content-linked ESL courses, which may align with many administrative policies in higher education. Most of the research conducted on the efficacy of CBI methods in higher education is considered short-term, comprising one academic semester or by reviewing annual performance results. Recently, many researchers have noticed a potential relationship between CBI courses and a student's long-term benefits such as higher pass rates, enhanced academic achievement scores, and overall improvements on GPA [11] [12] [13] [14]. According to [13] and [14], this latest trend also indicates that students receiving CBI intervention courses are comparable to, or in some cases outperform non-linked ESL students regarding overall GPA scores and language proficiency. This moves beyond the general notion of CBI courses as just another method of ESL pedagogy, by introducing discipline specific content with a student's L2, creating a rich contextual learning environment.

2. Literature Review

According to [3], longitudinal data analysis that directly links CBI methods to enhanced student performance is scarce, citing that most research focuses on provisional or short-term improvements. The objective of this review will be to examine the relationship between content-linked courses, and a student's academic achievements, with a focus on the long-term impact of CBI on student outcomes. The inferences derived from this research analysis have the potential to impact all tertiary institutions within Asia, and to a lesser extent, the global higher education community. To fully comprehend both the perceived and real benefits linking these two variables, I have reviewed empirical, conceptual, and theoretical evidence, while including historical references from the literature, to form a conceptual framework and to establish a baseline approach for this review.

2.1. Conceptual Framework

Over the last few decades, globalization, competition, budget constraints, student mobility across the tertiary sector, and demands for improved academic outcomes have ushered in a new era for higher education and global citizenry. According to [15], universities and colleges around the world have responded to an influx of second language learners, also known as L2 learners (an adult consciously acquiring a second language) or ESL students, by creating academic programs based on the English language; this is because English is commonly the first choice as a foreign L2, and is considered the dominant language in academia—including research.

This includes students at western universities that attract many foreign students, consequently they demand ESL courses be offered in the preferred L2 language, usually English [16]. Also, [15] suggests the growth of CBI in higher education, using English as the favored medium of instruction is based on student perceptions, while [9] advocate the cause as the ability to function professionally and academically, including international business trends. Since the early 1990's industry leaders and researchers have attempted to quantify and comprehend the connection between CBI methods and any perceived academic achievement benefits experienced by students [9].

The term content-based instruction predates the modern content-based language teaching (CBLT) method, with both approaches spawning from [17] theory of the Monitor Model and comprehensible input, which suggests students learn language more effectively through dynamic and meaningful content, with less focus on grammar and linguistic structure. Several immersion studies have illustrated the significant contributions that CBI makes in language and content learning, with perceived benefits including improved L2 fluency, functional content knowledge suitable for analytical and problem solving capabilities, with enhanced motivation, engagement, and higher academic achievement [18]-[23]. Many of these early studies focused on secondary education, with little reference to CBI's efficacy in higher education; hence, contributing to the scarcity of longitudinal research in the tertiary sector.

Much of the empirical research conducted on Content-Based Instruction (CBI), content based language teaching (CBLT), and Content-Language Integrated Learning (CLIL is a form of CBI, popular in high school and tertiary institutions), originates from the primary and secondary education level. In this instance, the majority of theories and concepts also cluster within this sector of education, with some researchers considering these variables malleable, extending beyond just this segment of education. In the early 1970's and 1980's various CBI pedagogical methods began to gain traction in the United States. This was as a direct result of low English proficiency levels, represented by ESL student achievement scores within all tiers of education [9]. In the 1980's and 1990's, shadowing the pedagogical achievements in CBI integration within primary and secondary schools, and in partial response to the internationalization of the

global tertiary community, universities in the U.S. and around the world begun to implement English for specific purposes (EAP) programs, which eventually morphed into the various forms of CBI used in today's higher education classrooms [24] [25].

2.2. CBI and Academic Achievement

Over the last decade, several studies have provided evidence that suggests CBI methods benefit younger students by improving L2 proficiency, and also directly contribute to improved academic achievement [26]-[31]. I would also argue the benefits of implementing CBI into higher education will result in similar outcomes, through comparative programmatic approaches, used both in the U.S. and Chinese tertiary institutions, through a mixed methods approach of English immersion, sheltered studies, and a transitional approach [31] [32]. However, it should be noted that variations occur with some frequency within the dynamics of CBI integration, between different countries and within each institution.

When determining the efficacy of CBI, another major theory and evolutionary practice in higher education are the theme-based, sheltered, and adjunct models. According to [33], the goal of these three models focuses on teaching course material to students on a regular interval, to achieve content knowledge and language proficiency. In this regard, the theme-based model of CBI is widely utilized in teaching L2 learners with lower proficiency, in content areas such as science and humanity courses, by selecting topics that are of interest to the students [33]. This method is often combined with the sheltered and adjunct models of CBI; additionally, [33] explains that universities often employ a blended approach that usually incorporates the adjunct model, because studies have shown the intervention produces increased academic achievement from the students involved in the program. These benefits have also been attributed to the defined characteristics of these three CBI models, as they all focus on specific academic topics and concepts, while integrating language learning in equal measures.

Both [34] suggest CBI methods are effective at promoting L2 proficiency and improving student academic achievement, because CBI multilingual instruction incorporates language learning and content, with the subject being utilized as a communication vessel to learn the L2 language. Also, [33] conducted research that involved 48 participants from a Kazakhstan university where the researchers investigated the relationship between the adjunct CBI approach, and measured the academic achievement of the participants over a short duration. While using inferential statistics, [33] reviewed the standard deviation values applied to the experimental and control groups after receiving a pre and posttest on knowledge and language content; the results show that $p = 0.05$, with an alpha of $p = 0.015$, which illustrates a significant difference between the control group and experimental group. These results suggested that [33] research supports the ideology that applying the CBI adjunct-model is an efficient medium for teaching science

content to undergraduate students using English as the L2, while also improving their academic test scores.

Additional research was conducted by [35] in the early 1990's using a comparison based statistical significance research design, looking at short-term benefits of multilingual CBI methods in a US tertiary institution. According to Cuervo [35], the research investigated the measured improvements in academic test scores, after implementing the CBI intervention method, on university students in a mathematics course over one semester. The study incorporated 118 participants between the experimental and control groups, while applying a one-tailed t-test, to reject or affirm the null hypotheses. The option to select a two-tailed t-test could evaluate the significance in both directions of significance; however, [35] decision to analyze the significance of the students' test scores was appropriate for this level of variable control, having opted to examine the data at a .05 ratio of significance. The main findings from [35] study suggested that CBI methods show a significant and positive effect on student test scores, as compared to traditional instruction. When [35] reviewed the second null hypothesis, the data results indicated that multilingual CBI methods also appear to promote better student retention. This probability is important to mention, as student retention is not addressed in many studies regarding CBI's efficacy in Higher Education.

In prior studies, enhanced self-esteem and reading proficiency levels have also been associated with improved academic achievement in students; in [36] research, this concept was tested against 56 randomly selected ELL secondary students in Lebanon. This study employed a questionnaire and experimental pre-test and post-test design, with a control group, analyzing the covariant scores between self-esteem, and the students' measured feelings of alienation as L2 learners, [36]. While applying descriptive statistics and a Likert scale for the survey scheme, this study indicated no significant improvement on immediate attributed gains, concerning better student self-esteem, resulting from the cooperative learning CBI intervention; however, the data reveals a marked improvement between the two reading achievement group scores, using a $p < 0.05$ alpha, in favor of the experimental group $F(1,53) = 7.69$, $p = 0$. Although not surprising, these outcomes suggest further longitudinal studies need to be performed for a deep understanding of the effects of CBI on achievement and other attributed benefits.

Within the realm of bilingual instruction, many studies have examined the short-term efficacy of CBI to promote academic success among L2 learners; however, few researchers have addressed the long-term sustained benefits of content-linked programs in higher education [37]. Overall, most of the early investigation into tertiary education and ESL content-linked instruction has consistently demonstrated that content-based teaching methods encourage second language acquisition, and improved academic achievement through enhanced GPAs [6] [7] [13] [22] [38] [39]. To realize such benefits, many CBI programs move beyond this simple linking arrangement between content and language;

more specifically, they integrate additional components into the curriculum, such as social events, academic, and personal advising, to create a rich immersive experience with student centric support.

Reference [3] investigated the link between content-linked instruction and student academic performance, by reviewing the effects of one specific type of CBI approach, known as EAP (English for Academic Purposes). His research focused on 770 participants from an undergraduate community college in New York; the study examined the long-term effects of CBI, by comparing the academic data of two experimental groups of students, one that received the content-linked intervention, and the other non-linked ESL group, over a 4-year period [3]. To mitigate any extraneous variables, [3] used a stratified random sampling technique, and compared student groups that were identical, other than being exposed to the content-linked ESL course. The academic data from both experimental groups was gathered by assessing the students' American College Testing (ACT) results, and by reviewing overall GPA scores.

After applying a Chi-squared test, the results ($X^2 = 38.3$, $df = 1$, $p < 0.001$) indicated the CBI intervention group were significantly more likely to pass the individual courses [3]. He then utilized a t-test and compared the overall GPA means of each experimental group; the results ($t = 4.72$, $df = 768$, $p < 0.001$) indicated a significant difference, suggesting that students receiving the CBI intervention achieved higher GPA scores [3]. This study is important, because it analyzed the longitudinal relationship between CBI and students' academic performance, suggesting that bilingual instruction methods consistently elevate academic success over a sustained period.

Reference [40] also used inferential statistics when assessing the significance of CBI, and the impact it has on student academic performance; he was building a case, based on previous research by [41], also [42], which suggested Content-Based Instruction courses for ESL students resulted in academic performance gains. [40] conducted the study at a community college in the U.S., using an experimental design with a total of 184 student participants divided evenly among the experimental and control groups. One group received the CBI intervention, while the other students were exposed to traditional teaching methods for L2 learners. Within the construct of [40] investigative protocol, the researcher limited extraneous variables by ensuring all participant demographics were uniform in both comparison groups, such as gender, age, and grade level; additionally, all teachers were limited to a certain number of students to ensure consistency. At the end of the semester all participants were administered a final exam; after using a t-test analysis, the results ($t = 5.58$; $p < 0.0005$), indicated a significant difference, in favor of the CBI intervention [40].

These results are vital to this research analysis, because they corroborate earlier research with similar variables, documenting the efficacy of CBI on academic achievement in tertiary institutions. As described in [42] the preferred research design for investigating the efficacy of CBI methods is through quantitative analysis, when evaluating the differences between experimental groups; however,

I would argue that additional univariate analysis or multivariate inferential statistical measurements will yield more support and credibility. Also, by incorporating questionnaires, observations, semi-structured interviews, and focus groups, this mixed methods design allows the researcher to differentiate the data collection process, and consider other perspectives that influence the variables and outcomes.

2.3. Student and Faculty Perspectives

According to [43], the student perspective is motivational and empowering ESL learners to acquire an L2 through the enrichment provided by content-linked courses. Reference [43] conducted a study that addressed the efficacy of CBI methods on tertiary students at Northeast Forestry University, Harbin, Heilongjiang Province, China; the research investigated the positive aspect of these bilingual teaching programs from the students' perspective. The researchers employed a qualitative survey methodology, and administered this questionnaire to 360 fourth year undergraduate students; each participant was randomly selected and the survey was divided among the engineering, science, and arts department [43]. The participants had all taken at least one content-linked course during their respective degree programs, and the survey results indicated a general trend that suggested at least 90% of the students from all three groups, believed that CBI intervention contributed to higher academic achievement scores in content specific areas, including a marked improvement in L2 proficiency [43].

While this study produced persuasive data, one must also question the research design, having used only a simple quantitative design to illicit responses and evaluate data. Incorporating a more rigorous investigative approach, such as a survey that is coded with qualitative features, or the introduction of other descriptive or inferential statistics may reveal additional trends and data subsets that lend to other conclusions. As a result of this evaluation, my analysis suggests more studies incorporate a student survey and include semi-structured interviews with faculty involved in the CBI intervention, this includes central tendency and multivariate analysis of the data to determine any underlying relationships. The results of this study are significant, because they demonstrate a link between student perceived benefits of enhanced academic achievement, after receiving a content-linked course [43]. This data helps further the argument that suggests various content-based instruction methods have a direct effect on students' academic performance; thus, contributing to the efficacy of CBI programs in higher education.

According to the [44], China continues to support bilingual education, therefore, many academic studies have originated here regarding the efficacy of CBI methods on student performance; another modern study by [45] investigates bilingual teaching of mathematics content to undergraduate students at Qinghai University in Mainland China. In order to understand this phenomenon, [45] conducted a survey of all student participants that attended a semester long mathematics course using CBI methods to learn content in the L2 language of Eng-

lish. Each student in the experiment was randomly selected to participate in the survey, and all students in the course were considered high-level performers, as evident by their ability to pass the College English Test (CET) 6, prior to the intervention [45]. From the ten question survey administered by [45], a particular trend among all of the students emerged, which is that consistently, over 50% of the participants felt content-based instruction in English was an efficient mode of acquiring professional knowledge, vocabulary, and a base for future L2 cognition. Reference [45] research is significant, because it points to a pattern of thinking, where student perspectives become reality as they compound bilingual talents through content-linked pedagogical methods.

Another recent empirical study that investigated CBI via the perspectives of faculty and students was [46] research, which utilized a case study methodology with qualitative features. This research is meaningful and relevant to my study, because it further clarifies the relationship between English Medium of Instruction (EMI) programs and other types of CBI methodologies within tertiary institutions, and analyzes the expectations and perspectives from the vantage point of various stakeholders involved in the process. One prominent aspect of [46] study incorporated a holistic approach to investigating CBI, with semi-structured interviews and observation between faculty and students. These findings are of importance to this review of literature because they establish a common belief and trend among students receiving (CBI) interventions, which demonstrates a perceived and real benefit measured by academic achievement.

3. Policy Review

Over the last decade, [5] suggests tertiary institutions around the world have compartmentalized and packaged various forms of CBI programs, making them available to ESL and L2 learners regardless of their degree specialty, but have administrative policies developed at the same pace as the methodology? Reference [5] takes a different approach to CBI research by addressing higher education policy, regarding multilingual programs in European institutions. Specifically, this study included five teachers from the University of Basque Country in Spain, and utilized a qualitative function and group discussion format, which lasted 1 hour and 12 minutes—it was also recorded for later analysis [5]. One of the leading research questions presented by [5] study involved the impact on learning and pedagogy by integrating a CBI program, which in some academic communities is referred to as a multilingual program.

Collectively, the findings reveal that teachers in some foreign universities feel CBI courses are an effective model for learning content and language, and stress the importance of balancing the implementation and training to ensure a smooth integration, yielding better student outcomes [5]. Additionally, this research indicated that higher education administrations should consider sustaining CBI courses throughout a student's entire degree program, in favor of clear policy language, avoiding some false assumptions and faculty misconceptions of the multilingual programs purpose [5]. Previous research in this area also indi-

cates that CBI methods are impacting more than just learning content through an L2 modality; the research community is just beginning to interpret the dynamics of content-based learning in higher education [47] [48] [49]. This study's design, centered around a qualitative approach, and has established a unique perspective, which revealed potential policy issues and solutions regarding the development of CBI programs in tertiary institutions.

Reference [50] study was designed with a mixed methods approach that provided certain distinctive benefits; it allows for triangulation of findings, which help support data sets underpinned by just one methodology, yielding a sharp conclusion to the research questions. The participants in [50] study included nine teachers from two English Medium secondary schools in Hong Kong, with the average teacher's experience more than 12 years instructing CBI classes; the 503 student participants were part of the 13 grade 9 and 10 humanities, science, and mathematics courses that were observed, with the students' age between 14 - 16. The data was analyzed from all 22 observed lessons, of which lasted 35 - 40 minutes, spread across various days of the week and different times of the day; each lesson was transcribed and coded using a quantitative structure, comparing the portion of student talk time, initial-response-feedback (IRF) sequences, and the measured language learning opportunities in the Humanities, Science, and Mathematics courses [50]. The results indicate the Humanities lessons facilitated higher mean scores compared to Science and Math, ("Humanities" $M = 3.26$ s/"Science & Math" $M = 2.06$ s), suggesting more student talk time in the Humanities courses [50]. The comparison also yielded higher IRF scores in Humanities courses, where teachers elicited more student responses and provided feedback regarding their L2 output, also denoting the CBI humanities lessons offered more learning opportunities for L2 cognition; the researcher also identified this content area provided more deep contextualized interaction, causing higher order thinking [50].

Overall, these findings suggest to academic policy makers that a paradoxical condition remains in CBI curriculum that needs to be addressed before implementation of any program, and certainly before curriculum is planned by language and content faculty. In this regard, [51] identified potential barriers to the successful implementation of CBI programs in any academic institution; thus, leading the way for much deeper research to explain the issues that influence language and content pedagogy. This is critical to the policy design of CBI and the integration of these methods into the classroom. In review of these selected research studies on CBI methods in higher education, there is an overwhelming sense of cohesion among student outcomes and data collection methods. In particular, when researchers aim to measure student achievement based on participants receiving one of the many forms of CBI interventions, test scores and GPA averages are analyzed against control groups to assess the direct relationship between the bi-variate samples. Reference [52] employed this technique when evaluating the efficacy of CBI on secondary students in California; or in a similar study, [3] highlighted the academic achievement of first semester ESL students,

by comparing testing pass rates and long-term academic success by analyzing retention rates and overall GPA, through descriptive and inferential analytics. When assessing the effectiveness of direct CBI intervention, both research in secondary and tertiary environments seem to indicate a positive impact on student outcomes; specifically, the evidence suggests content-based instruction methods enhance language proficiency and content knowledge.

After reviewing the CBI research herein, a relatively common trend emerges, which is the introduction of well-defined program objectives; many studies have investigated and established that clearly defined content and language goals are paramount to obtaining positive student outcomes. In particular, [53] found that teachers consciously assimilate elements of language development into content, when the language objectives align with students' sequential pattern of learning, which supports and reinforces emerging knowledge of the L2 and content area. This involves appropriate lesson planning that [53] emphasizes as a successful CBI scaffolding technique. This sector of CBI research leads to a formal awareness, regarding the application of administrative policy to content and language programs. Specifically, several studies have concluded that humanities subjects offer more opportunities of successful student outcomes after receiving CBI interventions [50]. Although multiple studies have been conducted that address implementing CBI methods on various subject areas, [50] suggests that much of the evidence is inconclusive, and advocates further longitudinal studies to investigate these policy concerns.

Challenges Confronting CBI in Academia

CREDE, (Center for Research on Education, Diversity & Excellence), outlined several challenges impacting CBI's success in K-12, and post-secondary institutions; the main factor in content-based instruction program success was choice [29]. There are several styles and forms of L2 acquisition such as two-way immersion, sheltered, one-way, transitional, ESL, and CBI approaches. Some studies have indicated that content-based instruction methods benefit students by offering more learning opportunities, with the focus split between language and content; however, [54] data reveals that fewer students will excel in CBI courses when compared to one-way instruction in L1 classes. Additionally, [54] research found that pupils were more likely to exhibit lower self-confidence in CBI programs than compared to one-way language centered courses, and learning goals can be missed for lower level students because the content is too challenging in the L2.

In much of China, CBI is also known as Chinese-English bilingual education, and according to [55], there are misconceptions and misinterpretations as to the ability of this method to produce the desired or advertised benefits. Another specific problem facing CBI in Asia is the socioeconomic and educational inequalities, where the promotion of bilingual education is not spread equally, causing an elitist perspective by some stakeholders [55] [56]. This has less to do with the efficacy of CBI; in essence, the availability of bilingual education in

China and Asia has caused a supply and demand curve, similar to the international economic concept of human capital.

Reference [55] postulates that by perpetuating bilingual education in the form of content and language instruction, people are unknowingly contributing to this notion of inequality, based on one's ability to gain command of their L2 or even L3, for the purposes of attaining a degree or gainful employment. However, [55] research is based on casual comparison, and the evidenced produced is lacking significant structure to accommodate the conclusions reached by the author. In response to this speculation, the MOE (Chinese Ministry of Education) has made further precautionary adjustments to policy that mandates ESL courses be offered at all public institutions, promoting the content-linked ideology; thereby, propagating L2 proficiency in the general population, regardless of socioeconomic status [44].

In opposition to [55] problematic perspective on CBI and bilingual education, [57] proposes that content-based learning, and to a larger extent multilingualism, is a benefit, not only to society but also culturally, through the cognition of linguistic nuances that shape understanding of different cultures. However, some research indicates that promoting CBI methods may hinder L1 development, although [54] study negates these concerns, with evidence that displays student achievement levels that are unaffected by CBI curriculum. Another divergent factor impacting CBI efficacy is that content and language instruction produces superior cognitive skills and divergent thinking in various participant experiments [54]. This seems to dismiss the few concerns or challenges that some experts have identified as problematic areas in the development of CBI as the dominant methodology in L2 acquisition in tertiary institutions.

4. Discussion of the Results

From the very inception of content and language learning, content-based instruction has been credited with both successes and some questionable failures; however, further development in program policy and pedagogical techniques have spawned this phenomenon, and trusted it into mainstream education around the globe [58]. Studies that focused on measuring the direct link to CBI interventions and student achievement over a sustained period of time are reporting similar findings, which advocate content and language learning as a premier choice when promoting L2 cognition [59]. This ascension throughout the years has attracted attention from various stakeholders, and inspired many studies on the efficacy of CBI methods.

Reference [1] research identifies a consistent trend observed by many stakeholders, this is in regards to the causal relationship between CBI methods and enhanced student academic achievement scores, L2 proficiency, and improved cognition of academic terminology germane to specific content areas, which is necessary for rich contextualized awareness. Exploring new ways to acquire language skills while meeting the burden of standardized testing and other required achievement objectives is a tedious assignment; however, [60] and [61] agree

that CBI methods fit this niche, and conveniently address language and content learning, while supporting the mission of higher education institutions.

This literature review also highlights the student and teacher perspective on CBI's ability to stimulate cognition and enhance academic achievement, while focusing on content and language in a balanced approach. The statistical information contained herein creates a unique vantage point; these results seem to indicate not only immediate performance enhancements, but some longitudinal studies are beginning to differentiate the long-term benefits associated with CBI interventions. The historical data on content and language programs also suggest CBI programs are on the rise in higher education institutions, with policy makers taking note from the success found in K-12 content and language programs. The globalization and internationalization of the tertiary market has forced universities to adopt L2 acquisition courses to remain competitive, this has created several challenges for CBI integration.

While these programs have been in development for many years, they vary in name, but all have related objectives, and similar to western institutions, China is one of the specific countries devoted to implementing and further advancing CBI's efficacy in higher education. China has a long history of experimenting and executing content and language programs in the curriculum, illustrating clear administrative policy in favor of L2 acquisition, which plays host to positive student outcomes. The challenges of successful content-based instruction curriculums are realized on a global scale, and the issues trending seem to emerge in research from all hemispheres, within all levels of education; these concerns are quality control, textbook publications, pedagogical technique, in-service training, and clear administrative policy language and program objectives. As tertiary institutions continue to integrate CBI measures into their course roster, standardization and quality control will be enhanced by the popularity and availability of this methodology in L2 acquisition. At present, the cause and effect relationship between CBI and student academic achievement is heating up, and more longitudinal research is needed to assess the impact of CBI on student performance over their entire academic careers'.

Additionally, [62] utilized an ex-post facto, mixed method design methodology, with the purpose of establishing a relationship between CBI interventions and student academic achievement along a 3-year academic period. Conducted at a large public university in southern China, this investigation evaluated student perspectives on the efficacy of CBI courses, as a means to enhance student performance. The results from [62] study yielded similar longitudinal evidence in support of a positive relationship between CBI interventions and student academic achievement. According to [1], the demand for bilingualism in contemporary higher education institutions continues to grow at an exponential rate; in response to this need, content-linked ESL programs have evolved to improve student outcomes. In the last decade, many studies have reported a potential relationship between CBI courses and a student's long-term benefits such as higher pass rates, enhanced academic achievement scores, and overall improvement

on GPA [11] [12] [13] [14].

5. Recommendation on Further Research

The statistics from around the world continue to demonstrate a spike in ESL enrollment at credit-bearing higher education institutions [2] [3] [4]. This presents a specific and immeasurable challenge for educators, where the goal is to quickly and effectively transition ESL students into the mainstream curriculum. The future development of content-linked programs require evidence based research to understand critical issues and advocate best practices for implementation so policy makers, government agencies, and students can fully realize the benefits of this approach to bilingual education.

The general scope of [62] study covered three academic years in a Mainland China university, and is considered a longitudinal investigation; however, the original intervention only occurred over one academic semester. This methodological design could be improved by extending the intervention cycles beyond the first year observed by the study. Additionally, the use of a t-test which is a parametric equation is consistent with the extant literature on CBI methods, though other inferential statistics could provide a unique analysis on the relationship between the variables. The common theme across the literature reviewed on content-linked courses indicates many scholars select ex-post-facto student data to compare quantitative statistics. This presents some challenges (viz., numerous extraneous variables, no active manipulation of the intervention, and difficulty performing pre and post tests), for these reasons, future inquiries should consider these limitations in causal comparative designs.

The majority of experiments reviewed in the seminal literature incorporate a relatively small sample size, this also includes most current research. Nonetheless, the findings of this analysis provide evidence-based statistics that replicate previous results using contemporary practices. Increasing sample size would greatly impact the validity and reliability of further research on CBI methods; more specifically, by widening the target population to include several universities, both locally and abroad, this would allow for easier transfeability and expand the capacity of this study to make broader generalizations beyond the Asiatic ESL tertiary community.

Further research in more diverse locations may encounter varying outliers and realize significant variances to the findings reported in this research analysis. Conducting a similar review with variable subsets such as isolating sex, religion, income, and ethnicity will inevitably provide even more value to the ESL tertiary community by replicating similar study's with a higher level of diversity, which again strengthens the ability to generalize the results to a broader audience. Consequently, additional research should be conducted that integrates this approach, using student motivation and perceptual data to drive the investigation, which may impact the quantitative data, or conceivably provide supplementary elucidation that contrasts this report.

Coincidentally, perhaps considering additional layers of exploratory techniques

(e.g., retaining a team of investigators, using research assistants, paid staff, etc.) may provide more support and impact available labor hours, also allowing the study to expand the scope or reach during the active inquiry phase.

More specifically, to fully explore this concept additional studies are warranted where perceived benefits are measured against quantified and tangible data on a larger scale to improve credibility. Although this review provided meaningful insight into the efficacy of CBI methods in higher education, it is recommended that further mixed-method investigations be conducted with active manipulation, to isolate variables from their root-cause allowing for a deeper understanding of the cause and effect relationship between content-linked curriculum and long-term student achievement.

6. Conclusions

The findings described in this analysis suggest a positive relationship between content-linked curriculum, and enhanced or sustained improvement on overall student academic achievement scores. Finally, this inquiry demonstrated the perceived benefits that students and faculty have towards CBI methods, which indicate that commonly, participants feel confident that content-linked curriculum leads to enhanced long-term improvement on academic performance, as compared to traditional ESL pedagogy.

Implementation of effective ESL programs in higher education is crucial to the success of students and institutions on a global scale. Meeting the demands of a shifting educational landscape is paramount to helping L2 learners develop linguistically, so they can compete in a multicultural, multilingual, and multiethnic society. Contextualized learning platforms such as CBI methods, inspire students to develop their critical thinking skills through a blended approach of acquiring academic terminology in the target language. The push for bilingual education is expanding at an exponential pace, and programs offering content-linked courses meet this demand, by establishing a meaning-based curriculum which has been linked to higher student achievement in the ESL post-secondary environment.

In summation, this systematic review indicates that CBI's efficacy reaches beyond just interim benefits; more specifically, the longitudinal impact has only recently been discovered. In coordination with this effort to explore the longitudinal benefits, more comprehensive research should be conducted on CBI's efficacy to promote sustained improvement in ESL students' academic success in higher education. This model of language learning warrants additional funding and administrative support in the tertiary community; hence, every effort should be made to continue refining and advancing the field of ESL and L2 acquisition while enhancing student outcomes.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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