

Evolution of English Curriculum: A Longitudinal Vocabulary Study of English Textbooks

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This corpus-based study investigated the transformation of English from an elite to a mass language as portrayed in textbooks used by five generations in Taiwan (ages of 20-69 years). By analyzing 989,629 tokens from 1921 lessons across 33 editions at elementary, junior high, and high school levels—from the 1960s to the 2010s—the study revealed distinct generational trends. Notably, the textbooks of the oldest generation, who experienced an era of elitist secondary education, exhibited more complex and extensive content than did textbooks for the generation now in their 40s and 50s. Notably, the textbooks for the generation now in their 20s had more content and a higher complexity level than did those used by the generation now in their 60s. The origin of the stark complexity gap between junior high and high school might be attributed to the 1968 implementation of compulsory education, a disparity that persists despite the introduction of English at the elementary level. Finally, the study recommends that curriculum designers should increase content quantity while reducing complexity in high school English textbooks to facilitate a smoother transition from junior high to high school.

Keywords: textbook studies, English as a foreign language (EFL), global English, world culture, historical study

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從菁英教育到普羅教育 ——英語文教科書歷史

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臺灣英語教育極少歷史縱向大範圍跨學習階段之研究。本研究檢驗各世代(20~60歲)在其國中小及高中所接觸的英文教科書,以比較教育中新制度學派世界文化理論為基礎,從教育普及化角度來檢視過去50年來的演變趨勢。共蒐集高中國中國小教科書共33版本1,921課,以語料庫字彙分析檢驗英語角色定位。研究發現1968年九年國民義務教育實施前英文課本的質量均顯著高於實施後20年,證實英語為菁英語言特性,但在40年內持續上升趨勢下,最年輕世代之英文課本質量已經超過最早英文還是菁英語言時的課本,顯示目前高中畢業生之預期英文程度和50年前只有少數菁英能達到的程度類似,且國高中之間的斷層在九年國教實施後出現,高中英文之質量是國中的2倍以上,此結果可解釋為高中英語課程仍以菁英教育方式設計,未考量近年來廣設高中政策將高中視為基本國民教育。

關鍵詞:教科書研究、英語為外語、全球英語、世界文化、歷史研究

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1. Introduction

This longitudinal study explored the changes in the role of English education by analyzing the English textbooks used by five generations of learners born from the 1960s to the 2000s. Taiwan's nine-year compulsory education policy was implemented in 1968, and its 12-year basic education policy was introduced in 2018. In the 2021 academic year, the number of high school or vocational school students in Taiwan was 585,629 (94.76% of the present cohort) according to the Department of Statistics of the Ministry of Education. Of these students, approximately 52% studied in (academic) high schools, and approximately 46% studied in vocational schools. This situation contrasts sharply that in 1970, when the number of high school graduates was 52,642 (Ministry of Education, 1987), or approximately 12.5% of the present cohort. In summary, a relatively small number of people studied in high school five decades ago. By contrast, today, after the implementation of 12-year basic education, half of all individuals aged 15 to 18 years attend a high school.

Most textbook studies have focused on single subjects at a particular educational stage (Chou, 2003). Taiwan's educational system, particularly teacher education, divides education into three stages, namely elementary school, junior high school, and high school. Accordingly, textbook production and review processes have been designed on the basis of this division, and as a result, few textbook studies have adopted a vertical cross-level perspective. The current study offers a panoramic viewpoint that investigates English textbooks from a longitudinal and cross-level lens to understand the evolution of English education in Taiwan over the preceding 60 years in light of the massification of secondary education.

The main purpose of the study was to determine whether the role of English education in Taiwan has gradually changed from one based on elitism to one based on mass education by examining the English textbooks that the current adult generations (i.e., individuals ranging from the 20s to the 60s in age) used at the elementary, junior high, and high school levels. For this purpose, two research questions were raised; the first focused on the lexical dimension of the corpus, whereas the second dealt with lesson content investigated through qualitative content analysis. The research questions are as follows:

1. What are the trends in the difficulty levels of English textbooks in the five generations according to a lexical analysis of the longitudinal textbook corpus? This research question is further operationalized into the following two questions:
 - 1.1 What are the changes in tokens, types, type-token ratios (TTRs), lexical profiles, academic words, and readability?
 - 1.2 What are the lexical learning curves in each of the five generations? Were the learning curves in the more recent generations as steep as those in the earlier generations?
2. In terms of lesson content, has English changed from an elite school subject to a mass education subject?

2. Literature Review

2.1 *World Culture Theory*

Regarding the prevalence of mass schooling, this study drew on the neo-institutionalists in the sociology of education. The neo-institutionalists are among few in the fields of comparative education and global educational policy who have paid close attention to historical trajectories and development at the macro level. In discussions regarding the globalization of education, world culture theory (WCT), an alternative term for neo-institutionalism (Carney et al., 2012), offers a crucial theoretical foundation to explain the changes and reforms of the educational system in a particular country from a global perspective (Spring, 2014).

WCT posits that certain hidden or implicit cultural norms and fundamental worldviews, which the neo-institutionalists call “world culture,” play key roles in the development of human society and education. WCT claims rational science or a scientific mindset as the basis of world culture. Science has slowly replaced religion in providing the prevailing theory that explains how the world operates (Drori & Meyer, 2006). Specifically, the belief that rational human beings can create and manage their own world instead of being manipulated by supernatural beings such as gods has fueled the prosperity of world culture.

The key medium for conveying this new world culture is compulsory schooling (Meyer & Ramirez, 2003), which actively teaches the values and worldview of world culture through mass education (Baker & LeTendre, 2005). Mass schooling, which became common around the world after World War II, was a product of nationalization, as modern nation states, with their institutions, began to be created on the basis of a prototype that originated in Europe after the Enlightenment. Schools are key institutions in a nation state, and modern education systems worldwide share plenty of common features because of their isomorphic construction (Meyer, 2007). A country's core curriculum usually consists of that country's national language, mathematics, science, social studies, the arts, and physical education (Meyer et al., 1992). Today, education is not only a means of developing human capital in a country but also considered a human right or an end in itself (Campbell, 2001). That is, schooling or being educated is largely taken for granted in the contemporary world.

Empirical studies regarding WCT have primarily focused on educational changes in various countries, particularly changes in the structures, forms, and organizations of mass schooling and those in its content. Examples include the global expansion and institutionalization of modern schooling (Ramirez & Boli, 1987a, 1987b), changes in school subjects since the 19th century (Meyer et al., 1992), evolutions in mathematics and science textbooks (McEneaney, 1998, 2003), environmental education in social studies (Bromley et al., 2011), and the massification of higher education (Ramirez & Meyer, 2013). McEneaney and Meyer (2000) proposed five main curricular changes that have been observed internationally:

1. The rationalization of society, particularly with respect to private issues such as those related to family, poverty, inequality, and gender, which had seldom been covered in textbooks;
2. Individualization by reinforcing the individual as the basic unit of a society (instead of the clan or family) and promoting individual agency, rights, competence, self-actualization, and social participation;
3. The rationalization of the natural environment through scientific analysis;
4. Globalization and the new goal of developing world citizens; and
5. Glocalization, namely situating the local within the global context and connecting the local with the global.

The proposed changes are based on studies regarding national education around the world in the 20th century. As the global spread of English accelerated in the late 20th century, English as a foreign language (EFL) as a school subject grew in popularity to the extent of becoming almost ubiquitous (Cha & Ham, 2008). However, changes in EFL curriculum content in light of WCT have not been explored in detail. The current study aimed to fill this gap given that EFL is a unique school subject because it can and has been learned and taught as a living language outside the classroom, which is usually not the case for other school subjects such as mathematics, science, and social studies.

WCT critics highlight its neglect of the West's colonial history and its pseudo-neutral stance toward existing power relations. Although science and its worldview have gained ground, many indigenous peoples who inherited aspects of local culture and local traditions have remained skeptical. In addition, the cultural fundamentalists and anti-globalization movement have regained momentum; some argue that political and economic forces, rather than world culture, may be the core source of social changes and human evolution (McMichael, 2016). The conclusions reached by Anderson-Levitt (2003)—who examined WCT at the national, school, and classroom levels from the perspective of educational anthropology—indicated that a homogenous and systemic world culture and education model have not appeared. Despite similarities in educational policy documents across countries, differences in classroom practices have remained conspicuous, with local cultures continuing to greatly influence teaching practices in some parts of the world. More specifically, educators in some localities have demonstrated creative methods of indigenizing, reinterpreting, and resisting global education models (Steiner-Khamsi, 2003). Although WCT critics refute the existence of a homogenous world culture, they recognize the strong effect that science and the scientific mindset have had at the policy level.

2.2 Empirical Studies on Textbooks

Textbook studies conducted by neo-institutionalists have mostly focused on mathematics, science (McEneaney, 1998, 2003), and social studies (Moon &

Koo, 2011). The only study about EFL (not English as a national language) is Cha and Ham (2008), which analyzed the time at which English became a compulsory subject and at which levels in non-English-speaking countries from 1850 to 2005. Their findings revealed three waves of EFL expansion at the secondary level: the first after World War II, the second in the 1970s, and the third in the 1990s. At the elementary level, two waves were observed, one after World War II and one the Cold War, but the required instructional hours were relatively low compared with those at the secondary level. However, the long-term trend of countries increasingly mandating English as a school subject in their national education curriculum is clear.

McEneaney (1998) examined science and mathematics textbooks at the elementary level in 53 countries from 1900 to 1995. Her findings indicate that science textbooks have increasingly emphasized participatory learning or learning by doing to connect scientific knowledge with people's personal environments and experiences. In addition, that period saw an increase in the number of female scientists and concepts presented in a humorous manner. The observed trends in mathematics textbooks were similar, albeit with fewer changes. The trajectory of the professionalization and institutionalization of science and mathematics is linked with individualism as modern schooling increasingly evolves into an institution that produces agentic and independent global citizens.

Moon and Koo (2011) analyzed 62 ethics and social studies textbooks at the elementary and junior high levels from 1981 to 2009 in South Korea and interviewed 28 educators involved in South Korea's civic education curriculum. Their findings revealed that portions of national civic education declined in the 1990s, whereas those of global civic education increased throughout the same period. However, national civic education remained the prevailing type of education, with global issues given only marginal representation in textbooks.

Textbook studies conducted by neo-institutionalists tend to be international historical comparisons aimed at verifying WCT. Curricular changes and reforms in a particular country involve multiple elements and thus require considerable contextual understanding. This reality was part of the rationale behind conducting the current study, which sought to observe the long-term trajectory of Taiwan's English curriculum in light of WCT.

2.3 EFL Textbook Studies

To date, content analysis has served as the prevailing methodology in textbook studies. However, corpus linguistics has gradually been adopted in such studies, particularly vocabulary studies. Corpus studies often use a large corpus as a reference to examine whether a smaller corpus exhibits similar patterns. For example, Hsieh (2010) analyzed collocations and frequently used words in English textbooks for vocational schools at the secondary level for comparison with a corpus of English learning materials for elementary school students in the United States. That study assumed that American English for elementary school students was the target level and model for Taiwan's English textbooks for vocational high schools. Lin et al. (2016) used the Lexile Analyzer program to examine the levels of difficulty of English textbooks in junior high and high schools in Taiwan and also mapped them to the corresponding English textbooks used in the United States. They observed that lessons within the same volume of a textbook varied greatly in terms of their reading difficulty and that gaps between grades were common, with most publishers failing to arrange their lessons as a logical progression from easy to hard. However, their most notable finding was that the reading level of lessons for ninth graders in Taiwan was approximately equivalent to that of fifth graders in the United States, whereas the reading level for 11th graders in Taiwan jumped to that of 10th graders in the United States. This considerable difficulty gap in English textbooks between junior high school and high school in Taiwan could have caused many high school students to abandon their English studies to focus on other subjects.

Corpus studies regarding textbooks have also examined connections between textbooks and entrance exams. Kao (2014) compared vocabulary in high school English textbooks with that on college entrance exams in Taiwan from 2001 to 2014 and observed that they overlapped by more than 90%. Cheng and Chang (2022) tested the hypothesis that high school English textbooks would provide sufficient preparation for college entrance exams by investigating their textual difficulties. After comparing lessons in textbooks with exam questions from 2003 to 2017, they discovered that the preparation from textbooks was insufficient in relation to four key indicators: low readability, low narrativity, high syntactic complexity, and a high required

vocabulary level for the reading passages on the exams. In other words, the reading passages on the exams had considerably higher textual difficulty than did the textbook lessons; students studied relatively easy passages in the textbooks, whereas the exams featured relatively difficult texts.

The scarcity of historical and cross-level examinations of EFL textbooks constitutes a research gap that this paper hopes to fill. Most EFL textbook analysis studies have analyzed only a single educational level, whereas few studies have covered all three levels (elementary school, junior high or middle school, and high school). The current study hoped to provide fresh insight regarding the long-term evolution of Taiwan's English education and to provide helpful suggestions to policymakers.

3. Research Methodology

The corpus linguistics method (McEnery & Hardie, 2011) was employed to answer the first research question. We first collected data by digitizing textbook content. Only main texts or readings were included in the corpus. Dialogues, songs, and cartoons in elementary and junior high school textbooks were regarded as main texts because students were usually required to study them. Grammar and vocabulary information and exercises were excluded.

A total of 33 editions of English textbooks were selected, with 11 each at the elementary, junior high, and high school levels. This selection was based on five prototypical students from five educational generations, namely people born in 1960, 1970, 1980, 1990, and 2000. English textbooks that these five students might have used in school were selected. The only exception was the high school textbook for the oldest student (that born in 1960), for which three of nine available editions were arbitrarily selected for comparison (see Ke, 2012). The collected textbooks exhibited high representativeness of the textbooks that the five generations had used as students. Details of these textbooks are provided in Appendix A.

The corpus contained 989,629 tokens. After the corpus was built and tested, word tokens, word types, TTRs, lexical profiles based on the Common European Framework of Reference for Language (CEFR), frequencies of academic words, numbers of words per sentence (WPS), the readability index

of the Flesch-Kincaid grade level (Klare, 1974), and intervolum changes (IVCs) of word types and TTRs were examined to measure the quantity and quality of the English textbooks. Regarding lexical profiling, the texts were analyzed using the widely used English Vocabulary Profile (EVP) on textinspector.com, which aligns texts with CEFR levels A1 to C2; if a word (e.g., a proper noun) is not on the EVP wordlist, it is categorized as “off-list.” Regarding the readability index, the Flesch–Kincaid grade level is one of the most commonly used readability indices; the number implies the US grade level; a score of 5 suggests that an average fifth grader can understand the text. The academic word list developed by Coxhead (2000), which contains general academic words used across multiple disciplines, was adopted to investigate academic words in the texts. The analysis results were then used to answer the first research question regarding whether the change in the status of English education from that of elite education to that of mass education was reflected in the English textbooks. Compared with mass education, in elite education, the learning curve tends to be steeper, with lessons involving more academic and professional vocabulary with a higher TTR (denser content) and higher readability grades.

Thematic coding for content analysis was applied to all lessons to answer the second research question. The coding procedures followed the principles of grounded theory (Corbin & Strauss, 1990) and were guided by the theoretical framework of WCT to highlight scientific and moral lessons. Each lesson was coded using the framework presented in Figure 1, which was developed through repeated coding and revising. Three coders conducted three rounds of preliminary coding on 100 randomly selected lessons to develop the framework. After the intercoder reliability reached 80%, two coders used the framework to code all the lessons. The final codes for the lessons with conflicting initial coding results were decided in coders’ meetings.

The second common type of lesson at the high school level was scientific lessons, which were lessons that included at fewest one paragraph of rational explanation of a phenomenon in the natural or social world. Scientific lessons were categorized into natural science lessons, social science lessons, and lessons involving both types of science. Subdisciplines in these lessons were also identified. Although most scientific lessons were written in an objective and informative manner, some used more creative or engaging methods—such as debate, dialog, and scenarios—to appeal to students. Scientific lessons,

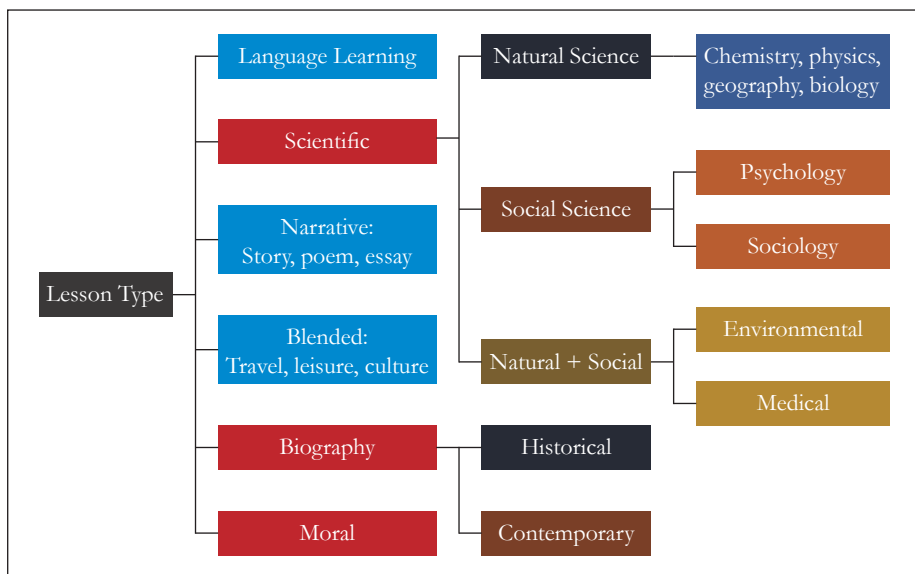


Figure 1. Coding Themes of Lesson Types

which accounted for nearly 30% of all high school lessons, were the main focus of content analysis, as we attempted to examine the curricular trend of rationalization observed by McEneaney and Meyer (2000). Because rational and scientific ideology was the key focus of the present study, we adopted a lenient approach when coding a lesson as scientific; specifically, regardless of its main topic, a lesson was coded as a scientific lesson so long as it contained a paragraph explaining a particular scientific concept. These lessons were later scrutinized in detail to determine how lessons from different eras differed in how they dealt with descriptions and explanations of the world.

When coding the lessons, we observed two types of lessons that may have been related to our topic, namely biography and moral. A biography lesson introduced a life history or key contributions by a particular person intended to serve as a role model for students. Changes in such role models in textbooks may reflect deep ideological and value shifts. Moral lessons function as contrasts to scientific lessons. The underlying values in moral lessons are worth investigating to discover additional perspectives regarding the rationalization of society.

4. Findings

The findings of the quantitative analysis designed to address the first research question are briefly described as follows:

1. What were the changes in tokens, types, TTRs, lexical profiles, academic words, and readability?

Answer: The tokens for the oldest generation were much more than those for the later generations, whereas the types for the latest generation outnumbered those for the oldest generation, resulting in higher TTRs for the most recent two generations. The results for lexical profiling, academic words, and Flesch-Kincaid grade levels were consistent because the latest textbooks were more difficult than the oldest ones.

2. What were the lexical learning curves in each of the five generations? Were the learning curves in the more recent generations as steep as those in the earlier generations?

Answer: The learning curves in generations 60, 70, and 80 were volatile at the junior high school level and tended to be steeper than those in generations 90 and 00, and considerable gaps between the ninth and 10th grades were observed in all the generations except for the oldest generation.

4.1 Quantity (Tokens)

In all the figures in this paper, “60,” “70,” “80,” “90,” and “00” represent the textbooks used by the prototypical students born in 1960, 1970, 1980, 1990, and 2000, respectively. The numbers on the x-axis represent the grade and semester (e.g., 3_1 represents the first semester in the third grade). Figure 2 indicates that the textbooks for the oldest generation (hollow black line) contained the highest quantities in most volumes, particularly at the junior high level. The curves for the younger generations (90 and 00) indicate that these students started to learn English relatively early and that the growth in quantities was gradual except for the final semester in junior high school, where a dip appears, which might be attributable to preparation for high school entrance exams. For generations 70 and 80,

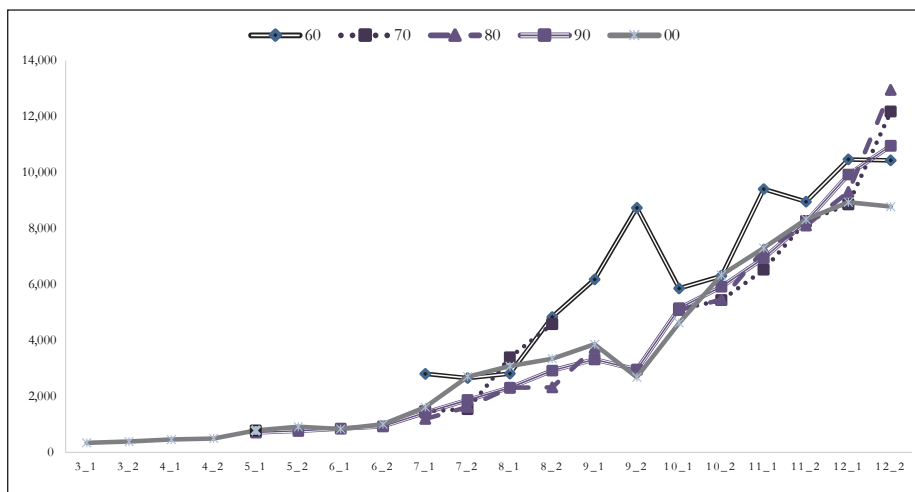


Figure 2. Average Tokens by Grade Across the Generations

English was an elective course in the final semester of junior high school, and this is the reason for the missing parts in the corresponding lines in the figure. At the high school level, the quantities were similar across the most recent four generations.

Figure 3 presents a generational comparison of token quantities across the three educational levels: elementary, junior high, and high school. At the bottom are five generations and the corresponding required volumes at each level. We calculated the average total tokens of the textbooks (ranging from four to eight volumes depending on the level and generation) at a certain level and juxtaposed the results in Figure 3. At the high school level, the oldest textbooks had the most tokens, with similar numbers of tokens observed across the other four generations. The slight drop from generation 90 to generation 00 could be regarded as the balancing out of token increases at the junior high and elementary levels. At the junior high level, before the nine-year compulsory education policy was implemented, the quantity of the textbooks was considerably higher (more than twice the number compared with the next two generations). After the privatization of textbook publishing, the tokens for generation 90 increased significantly. At the elementary level, a considerable increase was observed from generation 90 to 00. In summary, over the period

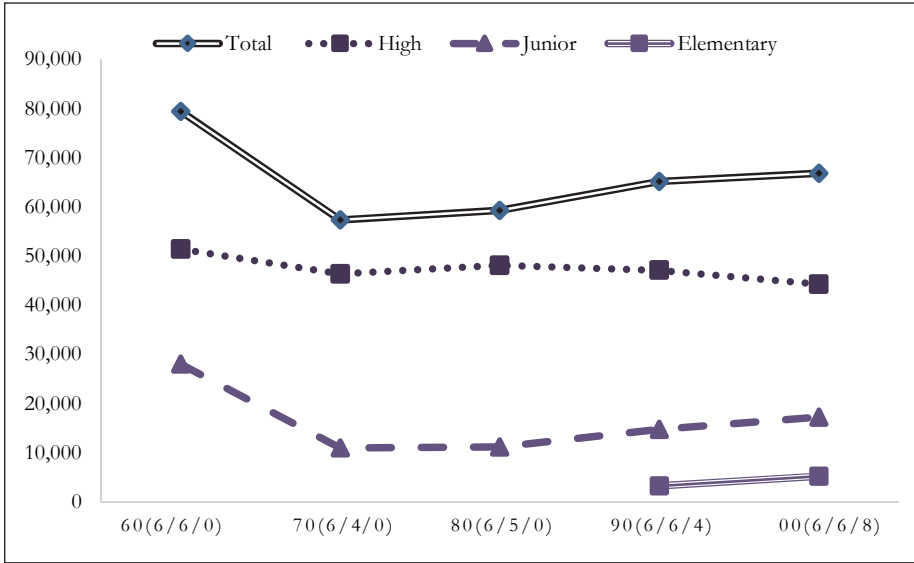


Figure 3. Total Tokens Across the Generations of Students by Level

analyzed in this study, students were increasingly exposed to more English education in school from an earlier age. In addition, this trend is expected to continue in the near future given that the total numbers of tokens for grades 3 to 12 for generation 00 were still lower than those from grades 7 to 12 for generation 60, in which only the elite studied English.

4.2 Quality 1: Word Type

We examined the word types (distinct words) in the textbooks to verify whether students in different generations were exposed to different numbers of word types. A higher number of word types, in general, indicates higher difficulty or higher quality.

Data related to the elementary level were excluded from Figure 4 because of the low numbers of such data. As indicated by Figure 4, the growth trends were smooth, except for that for the final semester of junior high school, when students had to prepare for the high school entrance exams. The junior high school textbooks for generation 60 contained a relatively large number of word

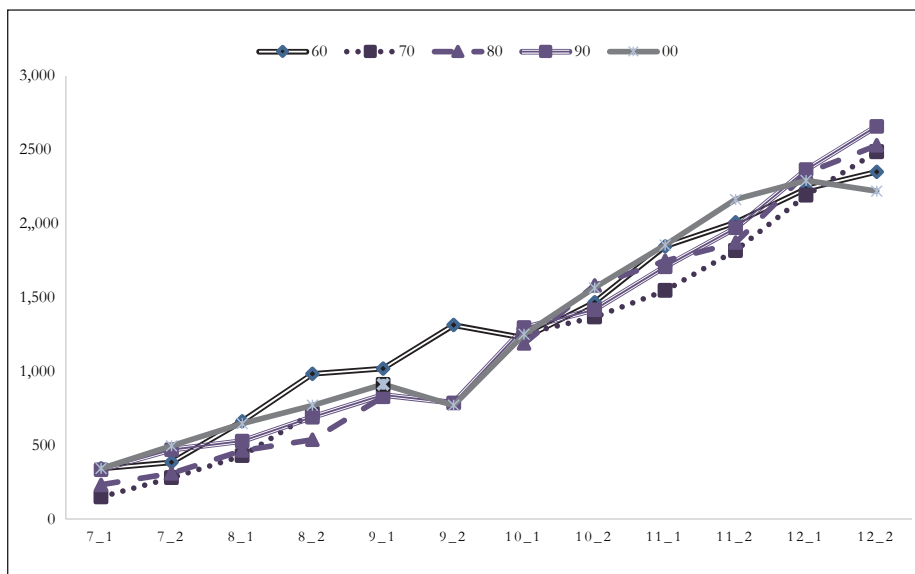


Figure 4. Average Numbers of Word Types by Grade Across the Generations

types because they also contained many tokens. The number of word types in the seventh grade for generation 70 was the lowest of the five generations; this outcome could have been an adjustment to the new situation that most people were able to attend junior high school after the nine-year compulsory education policy was widely implemented. English in the ninth grade for generation 70 was elective and likely intended for those who intended to study English in high school, namely elite students. Generations 90 and 00 started to learn English in elementary school and were exposed to more word types in most grades in junior high and high school compared with generations 70 and 80. However, this outcome may also be attributable to the increase in English vocabulary, as new inventions and consequently new words have appeared.

Table 1 draws comparisons among the total numbers of word types at the three levels for the five generations. At the high school level, a minor increase from approximately 5,500 to approximately 6,000 word types from the oldest generation to the youngest generation was observed. This study's interpretation of this result is that current high school students are expected to learn at least as many types of English words as their (elite)

grandparents who attended high school. Given that high school has been accessible to everyone in Taiwan since 2019, the feasibility (i.e., the extent to which students are able to memorize the vocabulary found in their textbooks) may be questionable, particularly for those who would not have attended high school if they had been born a generation earlier. The total numbers of word types from the elementary to high school levels across the generations (Figure 5) exhibited similar patterns. The next section 4.3 on TTR results further elaborates on this point.

At the junior high level, the numbers of word types for generation 00 were much higher than those for generations 70 and 80 but still lower than those for generation 60. The gaps in word tokens and types between junior high and high school remained large from generation 70 onward. In generation 60, only elite students attended junior high and high school. The implementation of nine-year compulsory education led to the simplification of the English curriculum at the junior high level, whereas the English curriculum at the high school level underwent no considerable change; this problem still remains unsolved after five decades, and it is an urgent matter that must be addressed by the Ministry of Education. This study suggests simplifying the high school English curriculum (by introducing mandatory courses and moving more difficult parts of the current curriculum to elective courses) and increasing the quantity and quality of the junior high English curriculum. As children in Taiwan start to learn English increasingly early, the English curriculum for public schools must continue to make adjustments on the basis of new circumstances.

Table 1. Total Word Types (Three Levels) for the Five Generations

Generation	60	70	80	90	00
Volumes in high school/junior high/ elementary	6/6/0	6/4/0	6/5/0	6/6/4	6/6/8
Average total word types	6,487	5,624	5,950	6,436	6,582

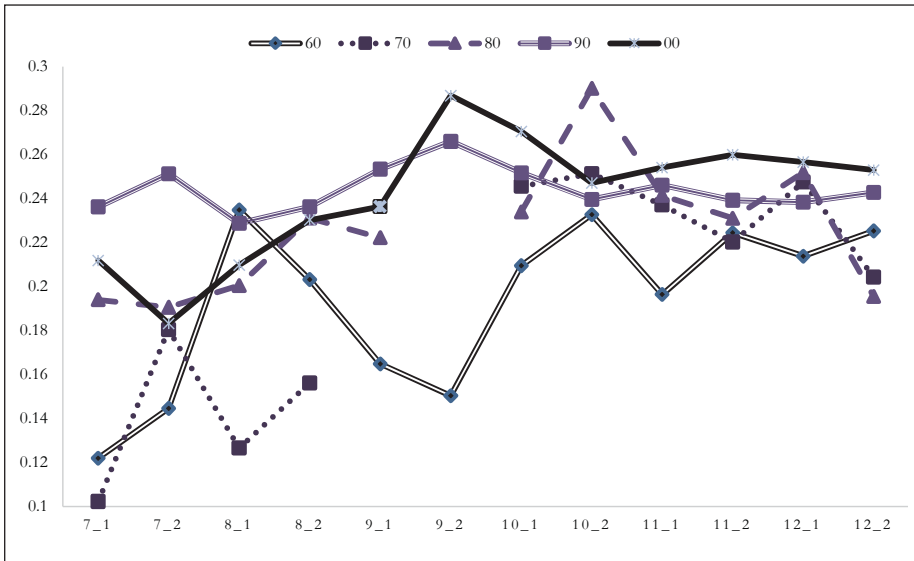


Figure 5. Average TTR by Grade Across Generations

4.3 Quality 2: TTR

The higher the TTR is, the higher the word density is, meaning more distinct words within the same amount of text. The results in Figure 5 suggest that the textbooks for the younger generations (90 and 00) appeared to have higher TTRs than did those for the oldest generation. This finding may imply that textbooks used in more recent decades are more challenging than those used in earlier decades. Thus, the quantity of textbooks should be increased (without the addition of many word types) to lower their TTRs and to create more repetitions of the same words. Compared with English textbooks in Nordic countries at the elementary level, the quantities of Taiwan's English textbooks were considerably lower (Chiu, 2012). The low TTR for generation 70 at the junior high level indicates an adjustment for compulsory education, as the TTRs were considerably lower than those of previous editions.

4.4 Quality 3: Lexical Profile

The third indicator was the lexical profile based on the CEFR word list. At the junior high level, across the five generations, nearly 80% of words were A1 words, 10%-12% were off-list words such as names and proper nouns, 6%-10% were A2 words, 1%-3% were B1 words, and approximately 1% were B2 words (Figure 6). This pattern is similar to the findings for word tokens and types; specifically, slightly more higher-level words were observed in the two most recent generations. The lessons in the 70 and 80 generations were easier, likely because in the first years of compulsory education at the junior high level, English texts were intentionally made to be relatively easy.

In the case of high school, the pattern indicates that the difficulty levels increased with each generation (Figure 7). The textbooks for the two most recent generations were the most difficult, followed by those for the 70 and 80 generations (National Institute for Compilation and Translation era), with the oldest generation having the easiest textbooks. The percentages of A1 words in Figure 8 indicate that the lessons in all volumes for the latest generation were 2%-5% more difficult than were those for the earliest generation. Regarding lexical difficulty levels, students from the later generations were exposed to more difficult vocabulary in high school; given that high school was previously perceived as a level of education only for the elites, this steady pattern was not surprising. A potential problem is that now that high school has been repositioned as basic education and more students are studying in high schools than in vocational schools, the lexical difficulty level is even higher than is that for the oldest generation, when only one in ten students studied in high school.

4.5 Academic Vocabulary

The academic word list of Coxhead (2000) contains 10 sublists based on the frequencies with which certain words appear in academic texts. As indicated by Figure 9, which presents the percentages of academic words over the total tokens for a certain generation, textbooks for the latest generation contained more academic words across all the sublists. Coupled

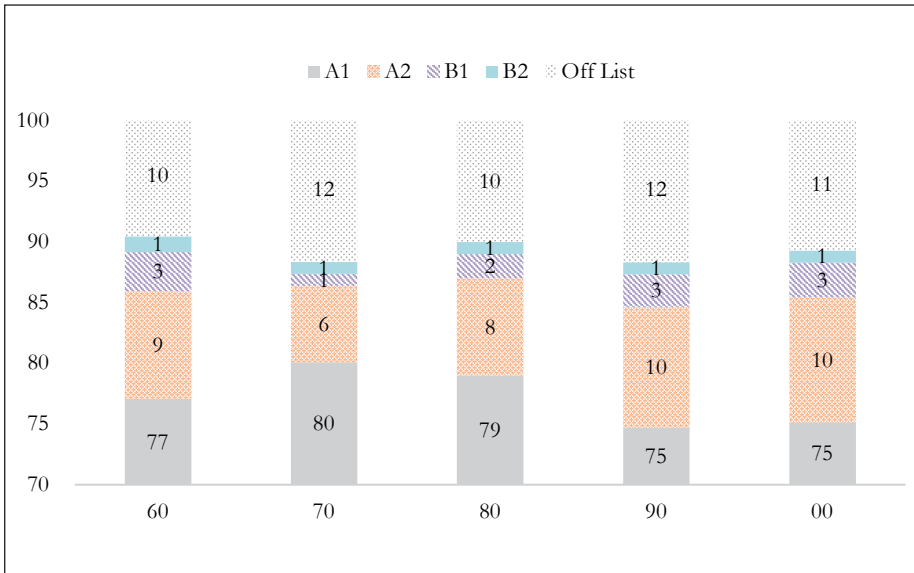


Figure 6. CEFR Lexical Profiles at the Junior High Level

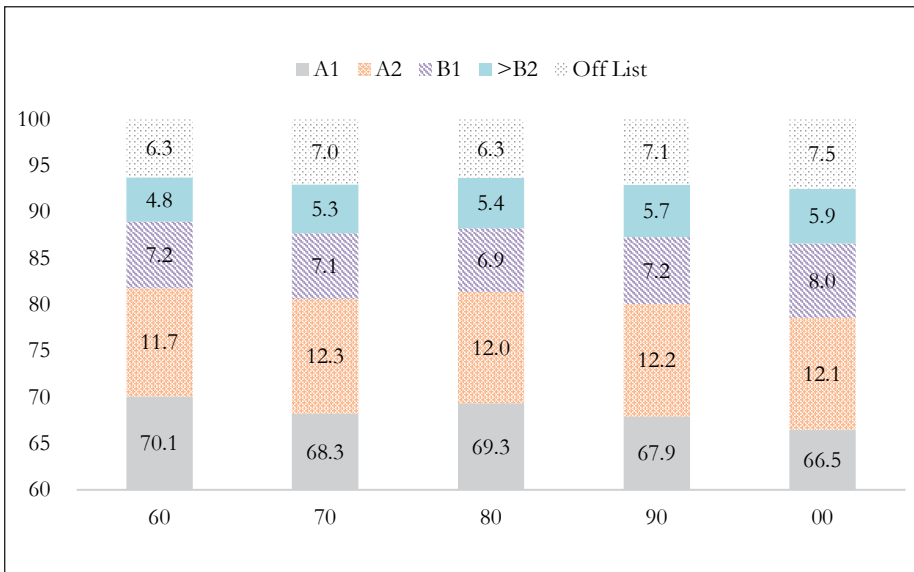


Figure 7. CEFR Lexical Profiles at the High School Level

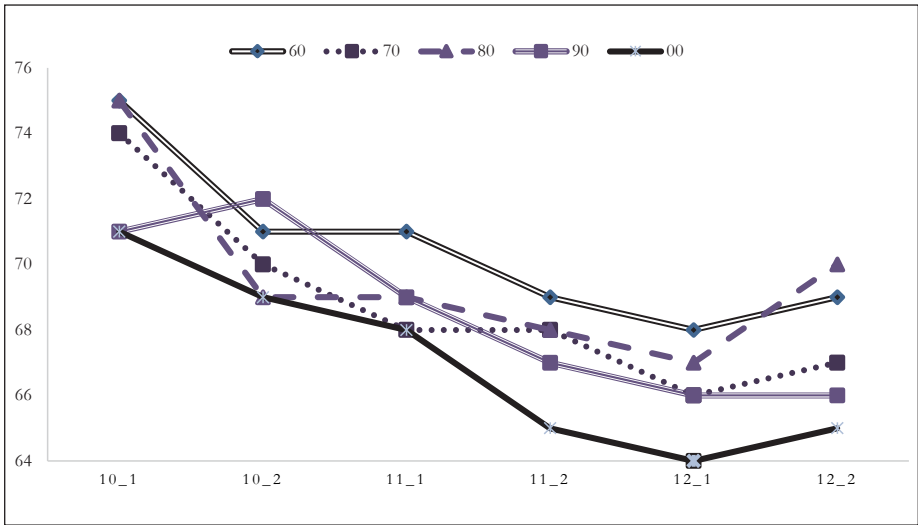


Figure 8. Percentages of A1 Words in High School Lessons

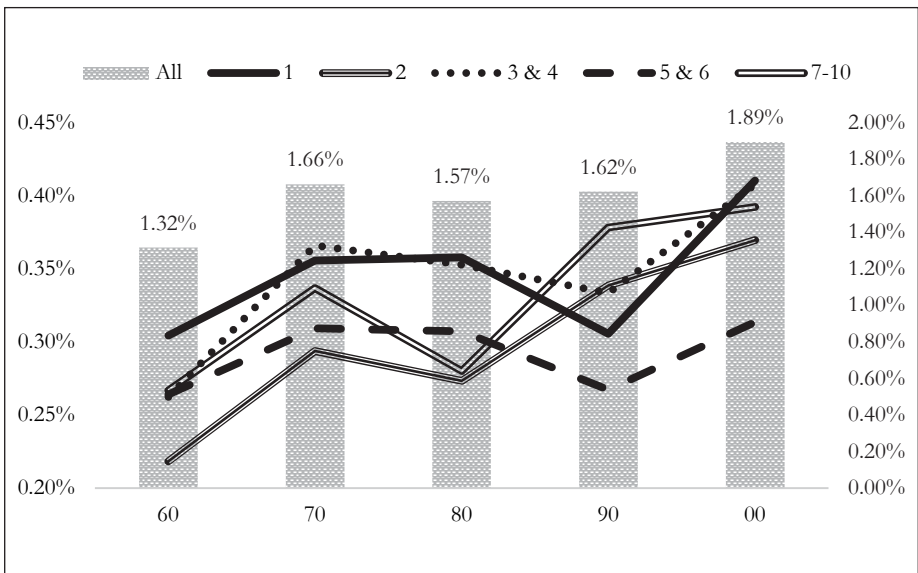


Figure 9. Academic Words by Sublist and Generation

with the findings detailed in earlier subsections of this paper, namely that the latest textbooks have the most word types and the highest TTRs (highest densities), these results suggest that English textbooks have become more difficult in recent decades. In addition, recent English textbooks appear to be more challenging than those for the earliest generation, of which only a small elite group of people attended high schools and junior high schools.

To further examine the details of academic words, we focused on more frequent academic words to observe changes. First, 340 academic words with a frequency higher than 10 were selected. The word families of these words were identified, and their frequencies were aggregated. For example, “available” appeared 49 times, and “availability” appeared once in the corpus, adding up to 50. We used the root word as the label for each corresponding whole word family. The average frequency of these 340 word families was 37, and thus, we selected 89 words each with a frequency of more than 37 to observe when they were used most often.

On the basis of their frequencies across the five generations, we categorized the 89 frequently used academic words into three types: typical (similar frequencies in all five generations, average deviation below 20% of the expected frequency based on all academic words in a generation), old (more in the three earlier generations and fewer in the two later generations), and new (fewer in the earlier generations and more in later generations). New academic words accounted for more than 60% of the 87 frequently used academic words (Table 2); this finding illustrates the increase in the number of academic words in the two most recent generations in almost all the sublists.

A few academic words are highlighted in the table for further discussion. First, an interesting contrast appeared; the word “method” was used more in the earliest generation, whereas “approach” was used more in the two most recent generations. Concordance examinations revealed that the usages of “approach” in the passages usually connoted a system of ways to solve a problem, whereas the usages of “method” in the passages tended to refer to particular ways and processes to achieve desired goals. These findings suggest an instrumentalist mindset in the textbooks for generation 60 and a tendency to theorize and provide rationales behind actions in the more recent textbooks and therefore resonates with the idea

Table 2. Three Types of Academic Words (Ranked by Their Total Frequencies)

Count	Typical	Old	New
	26	10	53
Sublist 1	area, major, process occur, individual, require, benefit, section, source	period, <u>method</u> , available, indicate	create, research, environment, percent, similar, identify, <u>approach</u> , involve, structure, role, economy , respond, specific
Sublist 2	final, achieve, seek, region	community	compute, culture, tradition, affect, design, site, construct, focus, credit
Sublist 3	physical, publish, instance, remove	constant	technology, physical, publish, locate, philosophy, task, react
Sublist 4-10	job, communicate, edit, equip, drama, aware, goal, transport, aid	energy, medical chemical, tense	team, stress, grade, image, adult, globe, intelligent, challenge, relax, symbol, reveal, theme, generation, display, couple, predict, expert, voluntary, obvious, project, style, author, survive, unique

of rationalization, one of the curricular trends identified by McEneaney and Meyer (2000).

The increasing frequencies of the academic words “create,” “research,” “environment,” and “economy” across the generations indicate increasing emphasis on creativity, scientific research, environmental issues, and economic development, respectively. Because these words were ranked by their frequencies, which reflect their importance, the fact that “economy” was ranked far lower than “environment” implies a discourse in which environmental issues are considered far more important than economic development. In addition, this conjecture is connected to an increase in environmental lessons, which are discussed in another section regarding the analysis of lesson content.

In the whole corpus, the most frequently used academic word was “compute/computer,” with 310 instances and more than half of these instances

appearing in the textbooks for generation 90. This word ranked second in each of the textbooks for generations 70, 80, and 00, reflecting the ascendance of computers and technology and their peak in popularity in the first decade of the 21st century (textbooks for generation 90). By contrast, the top academic word in the textbooks for generation 00, the most recent generation, was “culture,” which ranked fifth in the whole corpus. This shift from technology (hardware) to culture (software) may reflect the industrial upgrade from manufacturing to cultural industries, as English has transformed its role from that of an instrument (to assist in selling Taiwan’s products internationally) to that of a cultural carrier (that conveys Taiwanese culture to the world).

The older frequently used academic words “energy,” “chemical,” and “medical” were related to a few scientific lessons in the earliest generation. As detailed in the section regarding scientific lessons, hard natural science lessons appeared far more frequently in the earliest generation, whereas environmental and health lessons that blended social and human aspects with the natural sciences became more common in more recent textbooks.

4.6 WPS and Readability

To evaluate the readability levels, average WPS, average characters per word, and the Flesch-Kincaid grade level were calculated. Figure 10 presents the average WPS at the junior high level. The oldest textbooks had the highest WPS scores, particularly in the eighth grade, and in the other generations, the curves were similar. Similarly, in high school, the oldest textbooks had the highest WPS scores, followed by the textbooks in the two most recent generations. Those for generations 70 and 80 had the lowest WPS scores. Regarding average characters per word, the scores were similar across all generations.

At the junior high level, the Flesch-Kincaid grade level results indicate no discernible pattern. The score for the junior high textbooks in the oldest generation might have been misleading because some lessons contained Chinese explanations and grammatical sentence patterns. This could also be the main reason that the WPS score in the first semester of the ninth grade for the oldest textbooks dipped; that volume included many lessons with specific sentence patterns. As indicated by Figure 11, at the high school

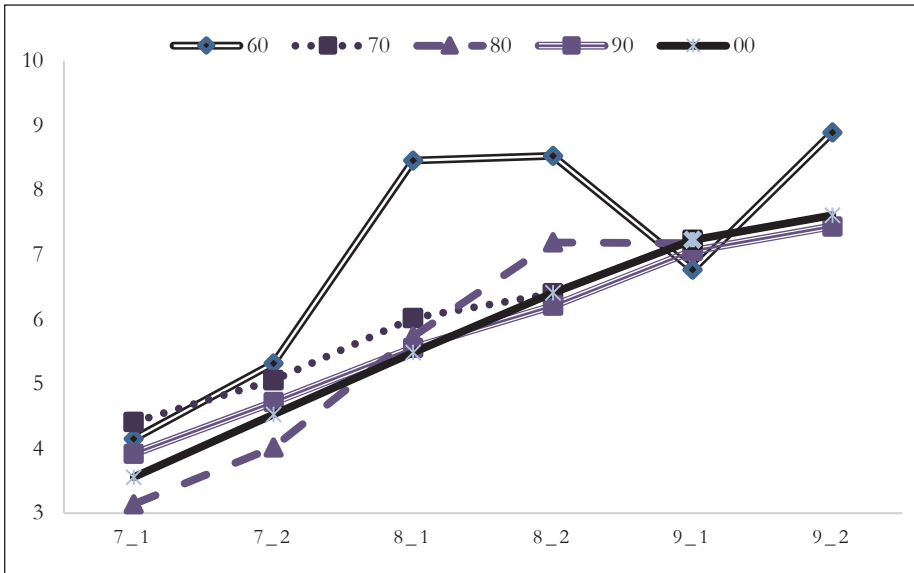


Figure 10. Average WPS Scores in Junior High School

level, the textbooks for the youngest generation were the most difficult, with approximately half a grade level higher across all volumes compared with those for the oldest generation.

4.7 Inter-Volume Change (IVC)

We calculated the IVC by using the percentage change (the difference between adjacent volumes divided by the number in the previous volume). Figure 12 presents the percentage changes of word types from the third-grade to the 12th-grade textbooks. Positive percentages represent increases in word types in the following volume. The results suggested fluctuating patterns at the junior high level. In the earlier generations, higher change percentages indicated steeper learning curves, which made sense given that those students started to learn English in the seventh grade. By contrast, in the younger generations (90 and 00), a sharp drop in the second semester of the ninth grade was followed by a jump in the 10th grade, the beginning of high school.

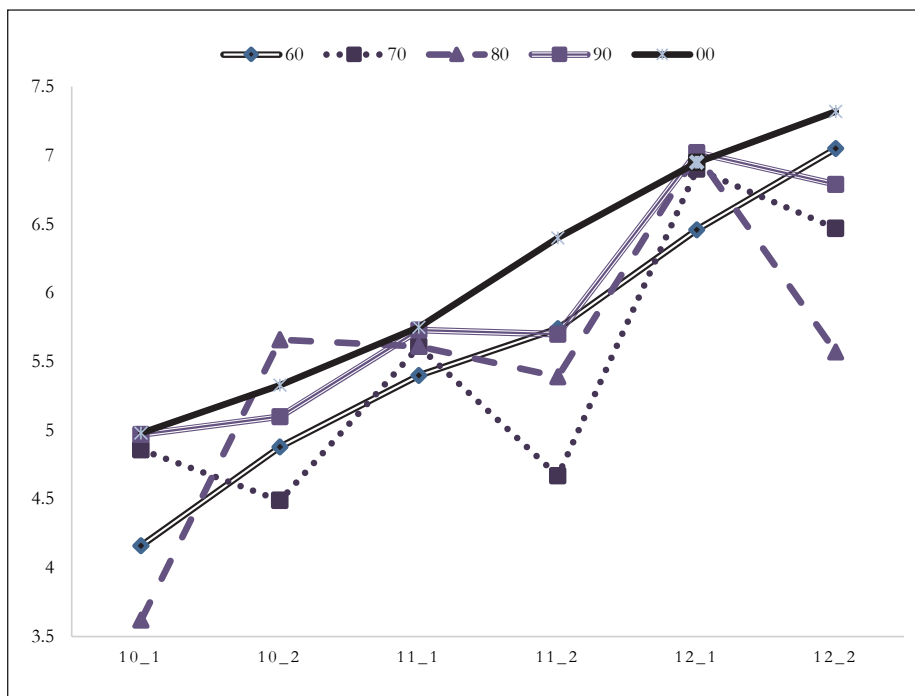


Figure 11. Flesch-Kincaid Grade Level at the High School Level

The intervolume increases in the five indexes were sharper in the two most recent generations (Table 3). The exception was generation 60 as both tokens and types both decreased from junior high to high school. When we compare the recent four generations, the proportions of difficult words, WPS, and Flesch–Kincaid scores did not change considerably, given that the junior high numbers for generation 70 were from the textbooks for the second semester of the eighth grade and that those for generation 80 were from the first semester of the ninth grade. The textbooks in the first semester of high school in the two most recent generations had higher percentages of difficult words, higher WPS scores, and higher Flesch–Kincaid scores than did those in the oldest generation, despite an overall 20% decrease in word tokens. As initially suggested by Lin et al. (2016), the large difficulty gap between the junior high and high school levels was further confirmed in this current corpus study. This junior high school-high school gap was exacerbated after

English became compulsory in elementary school in 2001. This outcome is illogical and thus should be adjusted to smoothen the learning curve.

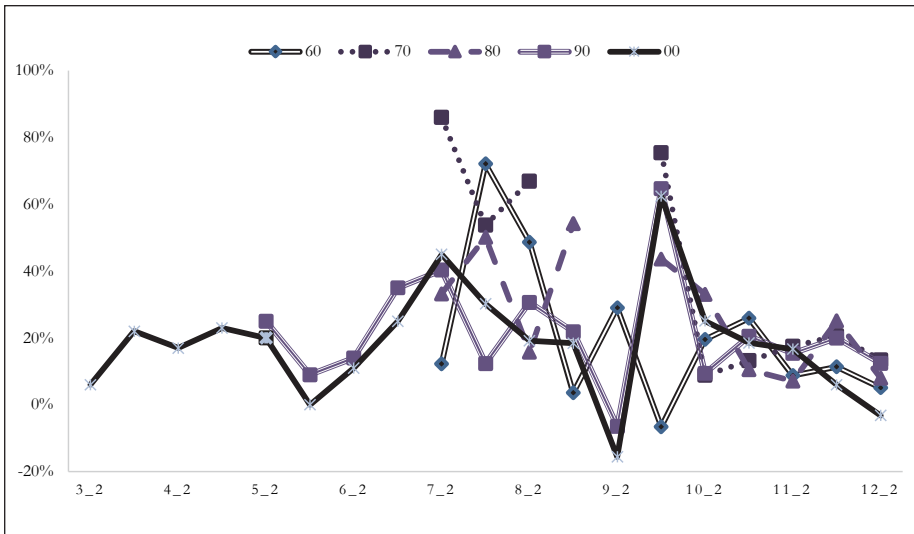


Figure 12. IVCs (Percentages) of Word Types

Table 3. Gaps Between Junior High and High School

Index	Token		Type		% of B1 above words		Words per sentence		Flesch-Kincaid	
	9_2	10_1	9_2	10_1	9_2	10_1	9_2	10_1	9_2	10_1
60	8,737	5,858	1,314	1,227	6	8	8.89	10.45	2.38	4.16
70 (8_2)	4,586	5,113	716	1,256	3	8	6.40	9.75	2.66	4.86
80 (9_1)	3,725	5,081	828	1,189	5	7	7.18	8.38	2.76	3.62
90	2,958	5,147	787	1,296	5	9	7.44	10.85	2.98	4.97
00	2,684	4,624	770	1,251	6	9	7.61	10.66	3.32	4.98

4.8 Lesson Content

The most common lesson type at the elementary level was language learning lessons, which are lessons focused on repeated sentence patterns. Such lessons accounted for 92% of all elementary school lessons. At the junior high and high school levels, the most common lesson type was narrative, which includes stories, poems, fables, and other literary genres; 37.5% of all junior high lessons were narrative lessons, and language learning lessons came in second with 28%. In the textbooks for generations 60 and 70, language learning lessons ranked first with approximately 40%, with narrative lessons closely behind; this order then reversed for the later generations. Junior high English textbooks increasingly contextualized their passages to make them more readable and relatable to students' daily experiences.

At the high school level, narrative lessons accounted for 46% of all lessons in the textbooks for generation 60 and then fluctuated between 25% and 34% in the textbooks for the next four generations. The average for narrative lessons was 33.6%. Scientific lessons fluctuated between 29% and 42%, with an increase in blended lessons, which increased from 12% in generation 60 to 35% and 28% in generations 90 and 00, respectively.

Our analysis focused on scientific lessons, as we examined related disciplines and how scientific concepts are presented for comparison with the WCT framework. Figure 13 indicates an increase in social science lessons coupled with a slight decline in natural science lessons. The disappearance of natural science lessons in recent English textbooks is surprising given that passages regarding scientific research are common in college entrance exams. Table 4 presents the percentages of scientific lessons from a particular discipline across the generations. Lessons in the fields of chemistry, physics, and geography disappear in the later generations.

The category of “natural+social” refers to lessons about medical and environmental sciences, which cover information regarding both the natural environment and human activity (Figure 13). The six medical science lessons in generation 60 discussed the human brain (twice), penicillin, microbes, antibiotics, and fatigue mechanisms. This content contrasts with that in the more recent generations, which focused on dieting, food groups, nutrition, sports and health,

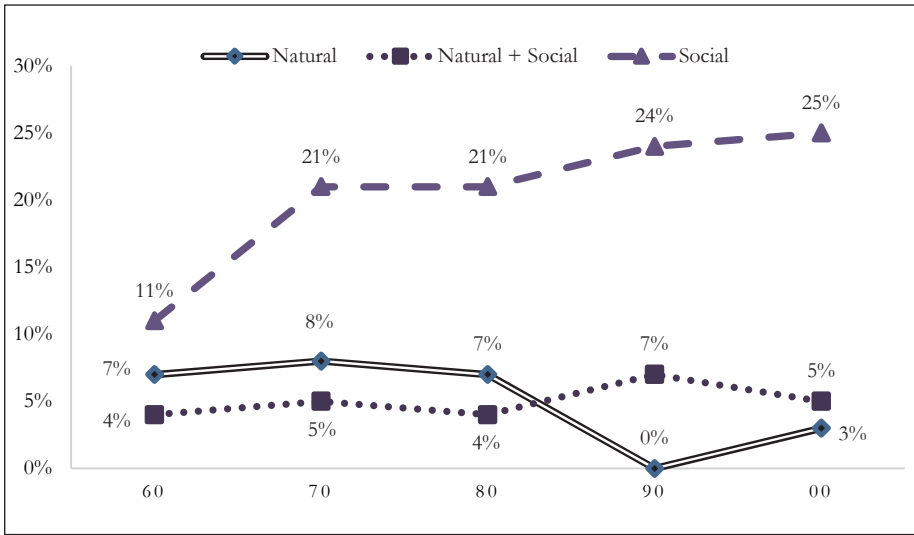


Figure 13. Scientific Lessons by Discipline

Table 4. Percentages (%) of Scientific Texts by Total Units in Each Generation

Generation	Chemistry	Physics	Geography	Medical Science	Environmental
60	2.4	2.8	1.6	2.4	0.4
70	0.0	1.2	3.6	1.2	2.4
80	0.0	2.4	2.4	1.2	2.4
90	0.0	0.0	0.5	4.2	2.3
00	0.5	0.0	0.5	2.9	2.4
Total	2.9	6.3	8.5	11.8	9.9

allergies, acupuncture, Chinese medicine, and cloning. In addition, the recent lessons were more relevant to daily life so that students could better relate to them. However, at the same time, just as technical (hard) natural science content disappeared in the later generations, more sophisticated and professional content in medical science was also increasingly excluded, likely because of

its inaccessibility for most students. This change in English textbook content contrasts with recent movements related to content and language integrated learning (CLIL) at the pre-tertiary level and English medium instruction (EMI) in higher education amid discourse related to bilingual policies. As English lessons gradually become less academic and professional, the emergence of CLIL and EMI brings new expectations for English education alongside increasing demand for students to be able to acquire content knowledge in English.

Next, we identified biography lessons to examine the individuals presented in such lessons. This study used the 20th century as an arbitrary cut-off point given that we (people born in the 20th century) tend to see those born in the 19th century or earlier as distant or historical. A historical figure is a person who died before 1900, and all others were considered contemporary figures. Table 5 indicates that historical figures accounted for more than three-quarters of all biography lessons in generation 60, whereas in the two most recent generations, contemporary figures dominated. This trend reflects the decline in attention to history and the increasing attention to the contemporary world in recent decades.

The analysis of the nationalities of the figures is presented in Figure 14, which reveals a clear trend. In the earliest generation, Americans and Europeans accounted for 80% of all figures, whereas in the most recent generation, no category had more than 30%. Diversity was an evolving trend. The local figures peaked at 42% in generation 90, representing the surge of the localization movement in the 1990s and early 2000s (Ke, 2012). Local figures dropped to 18% in generation 00, in which all five categories were between 10% to 30%, indicating diversity and a reflection of English as an international language. This result resonates with that of Ke (2019) regarding the decline of attention to local culture in English exam questions.

Appendix B details all the figures in the textbooks. J. K. Rowling was introduced six times in the two most recent generations; Martin Luther King Jr. and his famous *I Have a Dream* speech were included six times in textbooks spanning four generations. Five lessons focused on Benjamin Franklin, namely three in generation 60 and one each in generations 90 and 00. Notably, the three lessons in generation 60 had two different titles: *Benjamin Franklin, How I Arrived at Philadelphia* and *A Great Citizen*. The two lessons in generations 90 and 00

Table 5. Contemporary and Historical Figures in Biography Lessons in High School and Junior High Textbooks

Generation	60	70	80	90	00
Contemporary figures	24.0%	57.1%	50.0%	89.5%	76.5%
Historical figures	76.0%	42.9%	50.0%	10.5%	23.5%

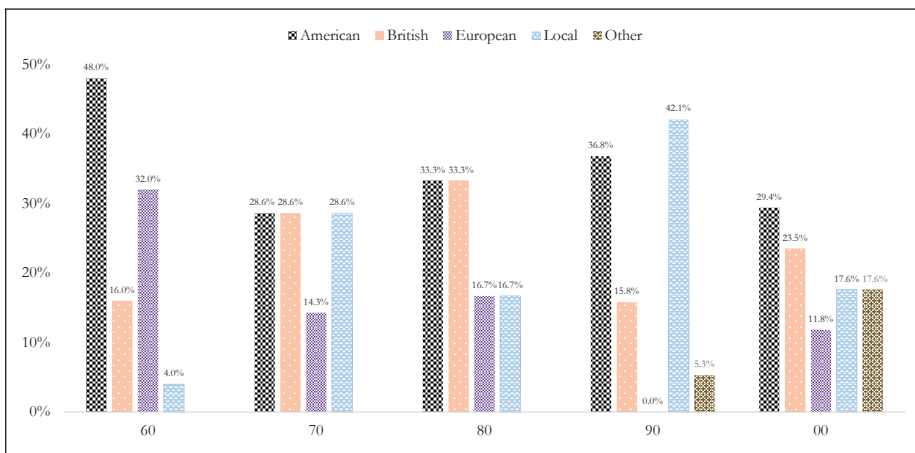


Figure 14. Figure Backgrounds

labelled Franklin as “The First American” and detailed his versatility, intellectual adventures, and innovative mindset. If Martin Luther King Jr. symbolizes equality and human rights, Benjamin Franklin represents scientific thinking and innovation, or the rationalization of the natural environment (McEneaney & Meyer, 2000).

Next, Confucius was presented four times in the first four generations but zero times in the most recent generation. Local figures included an aboriginal pop singer, a Buddhist master, a handicapped painter, a movie director, a young doctor, a singer who died young, and a dancer/composer. These contemporary figures all strove to achieve their life missions; they differed from the prevailing Taiwanese trend of working for small enterprises or tech companies and attempting to make a fortune as a successful entrepreneur or engineer. The

underlying role models in recent English textbooks were people from ordinary families who rose to prominence by applying their talents in a specific field.

This pattern was consistent with our analysis of moral lessons. In the moral lessons for generation 60, duty and effort were emphasized. Generation 60 students were advised to “listen and learn” from “the ant” and to do “chores” to make the best use of their “time” to achieve their goals through “pains” (Table 6). These ideas reflect the dominant ideology and social reality at that time, when Taiwan was striving to develop its economy. The moral lessons for generation 00 emphasize one aspect that was not mentioned in the earlier moral lessons: enjoyment. The “three steps to success” in one of those lessons are summarized as “do something that you enjoy, follow your dream,” and “never give up.” Other recent moral lessons also relate more closely to positive psychology than to external obligations and mental strength; a case in point is the contrast between “Where There’s a Will, There’s a Way” and “Already Perfect;” the latter advises students to avoid being perfectionists, to defy unrealistic idealist social norms, and to accept themselves to develop high self-esteem. In addition to the rationalization of society and the natural environment, the mental realm of the mindset has also been rationalized on the basis of positive psychology.

5. Discussion

The findings of this study confirm the major trends in curriculum changes at the global level initially proposed by McEneaney and Meyer (2000). This result

Table 6. Titles of Selected Moral Lessons

Generation 60	Generation 00
<i>Listen and Learn</i>	<i>Three Steps to Success</i>
<i>No Pains, No Gains</i>	<i>I Can!</i>
<i>Chores</i>	<i>A Taste of Chicken Soup</i>
<i>The Ant</i>	<i>Success</i>
<i>The Right Use of Time</i>	<i>Already Perfect</i>
<i>Where There’s a Will, There’s a Way</i>	

is not surprising given that English traditionally has often been perceived as a colonial tool for conveying Western values and ideologies to the rest of the world (Phillipson, 1992). Hidden values and worldviews correspond to societal progression from modernity to postmodernity. Rationalization (modernity) is gradually complemented by enjoyment (postmodernity) as citizens supposedly come to understand how the natural and social worlds operate while enjoying careers that they have independently embarked on.

However, English textbooks in Taiwan appear not to have adjusted to the trend of educational massification at the secondary level. This study observed that the textbooks for generation 00 had more word types than did those for generation 60, when mainly only the elite studied in secondary school. However, the quantity (word tokens) for generation 00 was lower than that for generation 60, implying a higher TTR (denser input) for generation 00. Given that a high percentage of the present study population will be enrolled in high school in the near future, the curriculum and textbooks intended for those individuals seem to set unrealistic goals for most of them. This finding may explain why English cram schools and independent English tutors have remained prevalent, as few students can absorb their high school English content through only three to four weekly periods in school.

The gap between junior high school and high school (Lin et al., 2016) might be attributable to the simplification of the English curriculum at the junior high level after the implementation of nine-year compulsory education in 1968. This gap appeared to have persisted even after the implementation of 12-year basic education in 2019. Thus, the current transition from elite to mass schooling at the high school level should be modified in a similar manner to when junior high school became compulsory in 1968. As demonstrated by Figures 3 and 5, the sharp decreases in the quantity and quality of English education at the junior high level between generations 60 and 70 suggest that the government made adjustments to the English curriculum in junior high school at that time and that the major byproduct of these adjustments was a gap between the junior high and high school levels. Thus, high schools continue to teach English for the elite despite junior high English targeting the masses. Therefore, to create a smooth learning curve and to eliminate this gap, the difficulty level in high school should be lowered, or the difficulty

level in junior high school should be increased; the most practical approach would be to apply both these solutions.

Next, because entrance exams play a crucial role in education, two suggestions are offered in light of the present findings. By contrast with Cheng and Chang (2022), who claimed that high school English should match the difficulty level of college entrance exams, this study's first proposal is that the difficulty level of entrance exams should be lowered. For example, top universities could offer their own exams that fit their recruiting needs. The second proposal involves the high school curriculum. Students studying at an elite high school or on an elite track (aiming to study at a top university) enroll in elective English courses to prepare for the entrance exams for top universities. However, for nonelite students, required English courses should focus more on daily communication and demonstrate a lower TTR and more frequent repetition of common words used in everyday situations to help students develop competence in intercultural communication. These suggestions are based on the idea that high school should provide basic education for all, not just the elite. The expectation that all high school students should be able to study and master the level of English studied by a few elites seems unreasonable.

The next issue relates to EMI, namely learning subject content through English, and CLIL, namely acquiring professional knowledge and English knowledge simultaneously. If an education policy prioritizes EMI or CLIL and plans to implement these methods from the low grades onward, conflicts with the fundamental goals of English education are likely to arise because English education for daily communication is considerably different from English education for knowledge acquisition. If the English-learning goal of CLIL is to reinforce English learning that prioritizes everyday communication, CLIL materials and pedagogies should be tailored accordingly; that is, the English used in CLIL should contain frequent uses of everyday terms instead of professional terms. Higher prioritization of everyday communication in English education is necessary in the lower grades, whereas textbooks for higher grades should focus more on English for academic purposes if the priority is to shift to facilitate EMI.

6. Conclusion

This study investigated the extent to which the English textbooks used by five generations of learners in Taiwan (those currently aged in the 20s to the 60s) reflected the changing role of English from that of an elite language to that of a mass language. The findings revealed limited changes; the quantity and difficulty of English textbooks for the oldest generation, for whom secondary education was mostly for the elites, were considerably higher than those for generations 70 and 80. However, the 12-year basic education policy has not rendered English a mass language, with the textbooks for the most recent generation having a larger quantity, higher difficulty, and a wider variety of academic words compared with those for the oldest generation. In addition, a difficulty gap between junior high and high school has persisted for 4 decades, indicating educational inertia. Educational changes are usually gradual, but in light of the marked social, economic, and political changes in Taiwan over the past 50 years, policymakers are recommended to consider possible adjustments to English education in Taiwan to adequately prepare future generations for the challenges to come.

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Appendix A: A List of Analyzed Textbooks

Generation	Elementary	Junior high	High school	Memo
Born 1960		1968 Curriculum standard (C.S.) NCT ¹ 84 lessons	1971 C.S. 3 private publishers: 海國／復興／遠東 253 lessons	Secondary education as elite education (not compulsory)
1970		1983 C.S., NCT 4 volumes 42 lessons (9th grade elective)	1983 C.S. NCT 84 lessons	nine-year compulsory education from 1968 Only the national edition available
1980		1994 C.S. NCT 5 volumes, 52 lessons	71983 C.S. NCT 84 lessons	
1990	NCCF, 170 lessons ²	NCCF 康軒／何嘉仁／南一／朗文／翰林佳音 240 lessons	1995 C.S. 龍騰／南一／遠東 216 lessons	NCCF, English starts from 5th grade
2000	NCCF, 346 lessons ³	NCCF(rev.) 康軒／南一／翰林佳音 144 lessons	1995 C.S. 龍騰／南一／遠東 216 lessons	English from 3rd grade, before the 2019 new curriculum framework
Total	516 lessons	562 lessons	843 lessons	1921 lessons

¹ 國立編譯館 (National Institute for Compilation and Translation)。

² Publishers in 2001~2005 (5th and 6th grades). 何嘉仁 Hess: Top English, 38 lessons; 康軒 Kang Hsuan: Coco and Momo learn English, 32 lessons; 朗文 Longman: Super kids, 20 lessons; 吉的堡 Kid Castle: English Now, 40 lessons; 佳音 Joy: Super Cool, 40 lessons.

³ Publishers in 2006~2010 (3rd to 6th grades). 何嘉仁 Hess: Hi! English, 55 lessons; 康軒 Kang Hsuan: Hello, Darbie! 62 lessons/New Wow English, 62 lessons; 朗文 Longman: Here we go, 62 lessons; 吉的堡 Kid Castle: Magic land, 45 lessons; 佳音 Joy: English, 60 lessons.

Appendix B: Figures (Biographies) in the Textbooks

B1. List of Major Figures by Generation (High School and Junior High)

Name	Total	60	70	80	90	00	Remarks	Level
J.K. Rowling	6				2	4	Contemporary/ British	High School (HS), Junior High
Martin Luther King	6		1	1	2	2	Contemporary/ American	High School
Benjamin Franklin	5	3			1	1	Historical/ American	High School
Confucius	4	1	1	1	1		Historical/Local: Chinese	HS, Junior High
Mark Twain	3	1	1	1			Contemporary/ American	High School
A-Mei	2				2		Contemporary Local: Taiwanese	HS, Junior High
Abraham Lincoln	2	2					Historical/ American	High School
Alfred Nobel	2		1	1			Historical European: Swedish	High School
Cheng Yen	2				2		Contemporary Local: Taiwanese	High School
Christopher Columbus	2	2					Historical European: Italian	High School
Helen Keller	2				2		Contemporary/ American	HS, Junior High
Isaac Newton	2		1	1			Historical/British	High School
Joe Dixon	2	2					Historical/ American	High School

(continued)

B1. List of Major Figures by Generation (High School and Junior High) (continued)

Name	Total	60	70	80	90	00	Remarks	Level
Mother Teresa	2				1	1	Contemporary/ Special Other	High School
Thomas Edison	2	2					Contemporary/ American	High School
William Shakespeare	2	2					Historical/British	High School
Winston Churchill	2		1	1			Contemporary/ British	High School

B2. List of Minor Figures by Generation (High School and Junior High)

Name	Generation	Remarks	Level
Albert Einstein	60	Contemporary/European: German	High School
Aristotle	60	Historical/European: Greek	High School
Booker T Washington	60	Contemporary/American	High School
George Frederick Handel	60	Historical/European: German-British	High School
Elizabeth Blackwell	60	Contemporary/British	High School
King Alfred the Great	60	Historical/British: Wessex (871-899) (a Saxon kingdom in southwestern England)	High School
Saint Francis	60	Historical/European: Italian	High School
Samuel Morse	60	Historical/American	High School
Socrates	60	Historical/European: Greek	High School
Chiang Kai Shek	70	Contemporary/Local: Chinese	High School
Bill Gates	90	Contemporary/American	High School

(continued)

B2. List of Minor Figures by Generation (High School and Junior High) (continued)

Name	Generation	Remarks	Level
Chang Yu-sheng	90	Contemporary/Local: Taiwanese	High School
David Beckham	90	Contemporary/British	Junior High
Hsieh Kun Shan	90	Contemporary/Local: Taiwanese	High School
Jackie Chan	90	Contemporary/Local: Hong Kong-ese	High School
Dalai Lama	00	Contemporary/Special Other: Tibetan	High School
Garrett Morgan	00	Historical/American: African American	Junior High
Lee Ang	00	Contemporary/Local: Taiwanese	High School
Leonardo da Vinci	00	Historical/European: Italian	Junior High
Lien Chia-En	00	Contemporary/Local: Taiwanese	Junior High
Lin Hwai-Min	00	Contemporary/Local: Taiwanese	Junior High
Louis Braille	00	Historical/European: French	High School
Milton Hershey	00	Contemporary/American	High School
Aung San Suu Kyi	00	Contemporary/Special Other: Burmese	High School
Steven Spielberg	00	Contemporary/American	High School