

Should Books Continue to Be Printed?

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Received: 24 September 2025

Revised: 10 October 2025

Accepted: 25 October 2025

ABSTRACT

A physical book—or simply a book—is also referred to as a tome, a publication, a volume, a printed book, written material, or a booklet. Per definition, it is made of soft material—paper, wood, bamboo, or silk—which is bound with thread or glue after having letters, symbols, and drawings written or printed on it. Recently, the e-books have emerged as a similar product. Although its content is very similar, it differs from a book in that rather than being written or printed on paper, the text is encoded and decoded electromagnetically or optically, or is distributed as data over a network (such as the Internet). In this article, we focus on books as a traditional form of printed material. We introduce the differences between books and e-books, and use this knowledge to deliberate whether books should be preserved in the future.

Keywords: Book, e-book, Newspaper, Dictionary

INTRODUCTION

A physical book—or simply a book—is also referred to as a tome, publication, volume, printed book, written material, or booklet. Per definition, it is made of soft material—paper, wood, bamboo, or silk—bound with thread or glue after having letters, symbols, and drawings written or printed on it. In a narrow sense, it refers only to multiple sheets of paper bound together at one end by a string or something similar. Recently, the e-book has emerged as a similar product. Although its content is very similar to that of traditional books, it is distinguished from a book in that it is not written or printed on paper, but, instead, is encoded and decoded electromagnetically or optically, or is distributed as data over a network (such as the Internet).

In this paper, we focus on books as a traditional form of printed matter. Although books continue to be printed in Japan, their number is declining. Some books, such as novels and photo books, are published as both e-books and books with the same content; however, others are only published in e-books format. In the case of e-books, if a person purchases a dedicated or suitable multifunctional electronic device, such as a smartphone, from an electronics store, mobile phone shop, or online shopping site, they can download and transfer the data to read the book. The number of bookstores in which physical books can be purchased are declining. In the case of e-books, data can be downloaded over a network, dispensing of the need to visit a physical bookstore. Many books are sold on online mail-order websites and can be delivered via courier; therefore, some people no longer have the habit of going to a bookstore to purchase books.

In the following sections, we introduce the differences between books and e-books, and use this knowledge to deliberate whether books should be preserved. We also consider the significance of libraries in which books can be read free of charge. Furthermore, we take newspapers and dictionaries as examples of books and consider their future.

Reasons for printing books being unnecessary

Table 1 summarizes the characteristics of the books and e-books. There are reasons why it is better to continue printing books and conversely, why it is unnecessary. If the reasons against its necessity are considered to be more or the most important, it would be better to stop printing and abolish physical books. In this section, we present reasons why printing may be unnecessary.

E-books have recently become popular because of the large amount of space required to store printed books. This problem affects not only individuals but also libraries and other organizations that have difficulty finding storage space for books. Apart from increasing each person's collection of books as physical or intellectual property, owning books also raises the issue of storage space;

if a person desires to purchase a new book but does not have space, they end up disposing of old books or refraining from purchasing new ones. For this reason, one view holds that even if a book has already been published in paper form, it would be more storage efficient to digitize and store older books, leaving only newer issues available in printed form¹⁾. With digital books such as e-books, the volume and weight do not increase in proportion to the number of books, thus making it easy to carry them when traveling. Instead of a paper book, an electronic device such as a smartphone is required to download and view the data, and purchasing this device incurs additional costs. New books and e-books are currently sold at roughly the same price (excluding used books), so one could say that the purchase price of the electronic device creates an extra financial burden; however, because it is possible to download a large amount of data onto a single device, this may not be a big burden. For example, if 100 comic books were stored on a tablet, the weight would be reduced from 20 kg (in the case of physical books) to approximately 0.5 kg.

In some cases, older adults may find it difficult to use electronic devices; however, if this hurdle can be overcome, e-books can be made easier for individuals to read by enlarging the text, changing the writing orientation, or changing the font to boldface or gothic. Some electronic devices have a reading function (although with current technology, unfortunately, some characters such as Japanese Kanji are sometimes misread), and e-books are therefore considered an excellent medium for making information more accessible. Electronic media are easier to purchase and rent. Data can be easily downloaded using any electronic device with Internet connection. Subscription services have recently been increasing in Japan, and more opportunities have become available to access multiple new e-books at fixed prices. Considering printed books from a broader global perspective, e-books have the advantage making the publication of books possible while saving resources such as paper and ink. This also implies that when books are discarded, the amount of waste that needs to be disposed of (by means such as dumping at landfills or incineration) can be reduced.

Reasons for printing books on paper being better

In this section, we give reasons why it may be better to continue printing books on paper. Books originated with writing or drawing (including copying) letters and pictures on paper, after which printing technology was developed. This is historically significant, as paper quality, fonts, and types and colors of illustrations in books produced in this way are thought to have evolved to reflect the social conditions of the time and are considered to have historical value. Changes in paper quality and color fading can, in some cases, be seen as signs of age (which may also be desirable)²⁾. Because books are printed on paper and persist, fonts are selected or developed accounting for human diversity (e.g., gender, age, and eyesight). These fonts sometimes match the paper quality and color, but with e-books, typeface can be changed at will, so one may not need to be concerned about it. Although not everyone holds this view, books containing academically significant information are thought to be important not only for their content but also for their appearance. Reasons for this include that they were printed on the only type of paper that could be used during wartime, or that certain printing techniques were used because the technological level was lower than it is today, and thus may be worth preserving.

Although increasingly fewer Japanese people are purchasing books due to the decline in the number of physical bookstores, online bookstores are still available (Figures 1–2). However, a physical store is more likely to offer a chance to come across a book by chance²⁾. Being intrigued by a book's cover or inadvertently picking up and opening a book one had not planned on buying can stimulate one's intellectual curiosity. Communicating with a bookstore attendant can lead to discovery of a book one had not planned to come across, thus rekindling a desire to read. A decline in the number of physical bookstores (Figure 2) may be contributing to a decline in reading.

Picture books can be the first step for children in learning various things, and are thought to stimulate different senses than e-books³⁾. For example, the texture of the paper, simple actions involved in interacting with pop-up books, turning of the pages at one's own pace or that one's parents, and reading aloud (or children having their parents read aloud) allow the content to slowly sink in and lead to subsequent creative thought.

This is thought to be possible, in part, because of the traditional nature of the book. It may be precisely because we read repeatedly using our five senses—touch, sight, smell, and, in some cases, hearing—that we develop an attachment to a book, and it becomes a treasure; e-books, in contrast, only appeal to the visual sense. Reading a book over the course of years leaves handprints and stains that become memories, which is less likely to be the case with e-books. When parents choose picture books for their children, a physical store has the advantage of allowing them to see the actual product prior to purchase. In Japan, McDonald's, a global fast-food chain, offers miniature books as a free gift with set menus. It is believed this is done because books are valuable. Online bookstores only allow a person to view some of the content, but not all of it; moreover one cannot assess the quality of the paper.

In addition to passing on bookbinding techniques, the maintenance of bookstores and libraries, as well as the associated employment of staff, seems important for the persistence of publishing and related industries¹⁾. We have previously stated that e-books make it possible to save paper and ink, but the development of new paper and ink and advances in bookbinding technology are being made

out of necessity, and their continued use is necessary to prevent the industry from declining. On the one hand, e-books may save resources such as paper and ink, but on the other hand, they may stagnate in their improvement and refinement.

In addition, even if the number of new books being printed decreases, there is a chance that books that have already been released will remain. This is because the content of new books can be obtained at a low cost, and people may desire a book as a physical object at hand. It is also said that although the number of books published by major publishers in Japan is decreasing, self-publishing is increasing. This may be the result of an overall decline in book printing, leading publishers to resort to businesses with individuals. Some people desire to have their writings circulating publicly and leave them for future generations, even if it means self-publishing; in such cases, publishers will not lose even if the book does not sell, so this format is likely to become increasingly commonplace. Even if an author writes on the Internet on a personal blog or some other platform, the content may be deleted by the administrator or because only new content is allowed to remain—these platforms are therefore not suitable for preserving old thoughts.

Role of libraries

This section somewhat veers off from the main topic of the book itself. Some believe that there is no need for places such as libraries where printed books can be read free of charge or at a low cost⁴⁾. This might be true if all the information people need can be found by searching the Internet or if a person can readily purchase as many books as they need. Since not everyone has the time or money to do so, libraries still have reason to exist.

In Japan, most libraries are public, and local governments and universities often open their spaces and allow visitors to browse printed books free of charge⁵⁾. In such places, e-books are rare. If e-books are available, these are kept only for a lack of space for more printed books. From a Japanese perspective, these facilities offer relief for families who cannot afford to buy many books, a place to communicate with others through reading, and a place for older adults to pass time satisfying their intellectual curiosities. Therefore, it seems meaningful for local governments to provide not only reading materials but also a place of relaxation. Books are one such tool; even books that are rare or expensive and cannot be purchased by individuals can be read in libraries. It is convenient to have the option of browsing freely even if one only desires to read a few pages¹⁾. Librarians are professionals who help people search for and select books they want to read, and we believe that the need for them will never disappear. Therefore, libraries will likely continue to exist, and so will books. If the situation evolves to a point where physical stores are no longer necessary, similar to the case where online consultations are now used for purchasing medicines, we believe that libraries may continue to exist, only on an online form. However, this will not happen in the near future.

Example of newspapers

Newspapers are conventionally printed on paper and can be delivered to one's home on a daily basis, or purchased and read at certain locations such as kiosks at train stations. Newspaper content is curated between late the night prior and early the morning of day of publication. In recent years, newspapers have also become available in electronic form. Unlike dictionaries, which will be discussed hereafter, it is now common for the content of printed newspapers to be digitized. In some newspapers, the format of the text is often the same as, or very similar to, that of the printed version, and is not necessarily newer or more extensive because it is an electronic version. This is thought to be because, owing to its long history, printed matter has become an accepted in society. Therefore, newspaper hard copies remain the main focus at present, with electronic versions serving to complement these. It is also believed that publishers intend that people should read the advertisements in a newspaper; the reason being that newspapers earn revenue not only from selling newspapers but also from advertising. This may also be a way for dedicated news agencies offering printed copies to differentiate themselves from news sites on the Internet such as Yahoo and Google (which have completely different appearances).

An advantage of newspapers is that they can be read anywhere and disposed of immediately after reading; moreover, the paper can be reused for something completely different (e.g., as a drying mat or wrapping paper). However, the number of newspapers published is gradually decreasing. If the majority of people felt that printed newspapers were unnecessary, a shift toward electronic media would be expected; however, this does not seem to be the current situation in Japan.

Example of dictionaries

The significance and advantages of printed dictionaries are believed to be: **(A)** memory consolidation, **(B)** separation of ownership and access rights, **(C)** paper consistency (spatial control), and **(D)** serendipity⁶⁾. A possible reason for **(A)** is that specifically the effort required to look up a word in a dictionary may facilitate remembering words and their meanings. Alternatively, looking up words may be considered as analogous to remembering lines by repeating them aloud or writing them down to memorize them, which engages multiple senses (such as touch in addition to sight).

Regarding **(B)**, because dictionaries can be expensive, it is often the case with printed dictionaries that the owner and user are different people. Even if one does not own a dictionary, it is still possible to find your way to a wealth of words by borrowing one; as mentioned above, libraries are an implementation hereof. In Japan, dictionary references are taught in Japanese language classes from the third grade of elementary school onwards and are said to be included in the Course of Study (the educational curriculum standards for primary and secondary education issued by the Ministry of Education, Culture, Sports, Science, and Technology). This learning method aims to help students acquire attitudes and methods of learning on their own and is said to be effective in acquiring language skills and increasing motivation to learn. Thus, it is the case with printed dictionaries that one can have a variety of content depending on the publisher and type of dictionary. Television dramas and novels have been based on dictionaries, in which the protagonist becomes interested in the different definitions of the word “love” in different dictionaries and the differences in word choices in dictionaries from different publishers⁶⁾.

People often use dictionaries to look up words of which they do not know the meanings, but coming across a different word on any given page can stimulate their intellectual curiosity (so-called serendipity, **(D)**). Electronic dictionaries have been developed in recent years, but they are specialized for looking up words, and only the headwords (primary words) of terms similar to the word being looked up are displayed; thus, there are few opportunities to fortuitously come across the meanings of new words. No electronic dictionaries have the same format as printed dictionaries, and in addition to the data volume, there are also challenges with the structure and functionality of the electronic medium, such as the time it takes to reconstruct the data to be read—this relates to **(C)**.

Dictionaries require you to turn pages, which can be time consuming and stressful; however, technology is constantly evolving to make dictionaries lighter and their pages easier to turn. This will likely affect the persistence of the bookbinding industry.

Wikipedia is a useful website because it contains more detailed and varied information than electronic or paper dictionaries. Unfortunately, because it is editable by anyone, the objectivity and accuracy of its content is questionable, and must be verified through further research and comparison with other sources. This situation is similar to that with the current use of AI, such as ChatGPT and Gemini, of which the responses are based on deep neural networks trained on information from a variety of sources, making it challenging to determine whether the responses contain inaccurate information and require additional scrutiny (increasing the volume of the training data causes a problem of insufficient human curation of information). Currently, AI responses remain inaccurate, and it is said that they will never attain 100% accuracy. Therefore, it is likely that the need for books and e-books to obtain accurate information will remain.

CONCLUSION

In this article, we have introduced the differences between books and e-books, and used this knowledge to investigate whether books should be preserved. Based on the results of this study, if the written content of a book is all that is needed, printed books may decline and disappear, which saves paper and ink. If we consider that the effects that appeal to senses other than sight can be obtained from aspects such as the binding, paper texture, and letter font, and that these may be used for learning purposes, then even if the number of printed books decrease, they may never disappear entirely. Owing to effects other than the visual, it is possible to read or imagine things that are not directly written. This is likely why printed materials such as newspapers and dictionaries are still purchased by many.

All things considered, printed books seem to have advantageous characteristics that e-books do not have, and are therefore worth preserving. However, the possibility remains that these characteristics may be compensated for by other means. We may need to keep a close eye to see whether books will disappear in the future.

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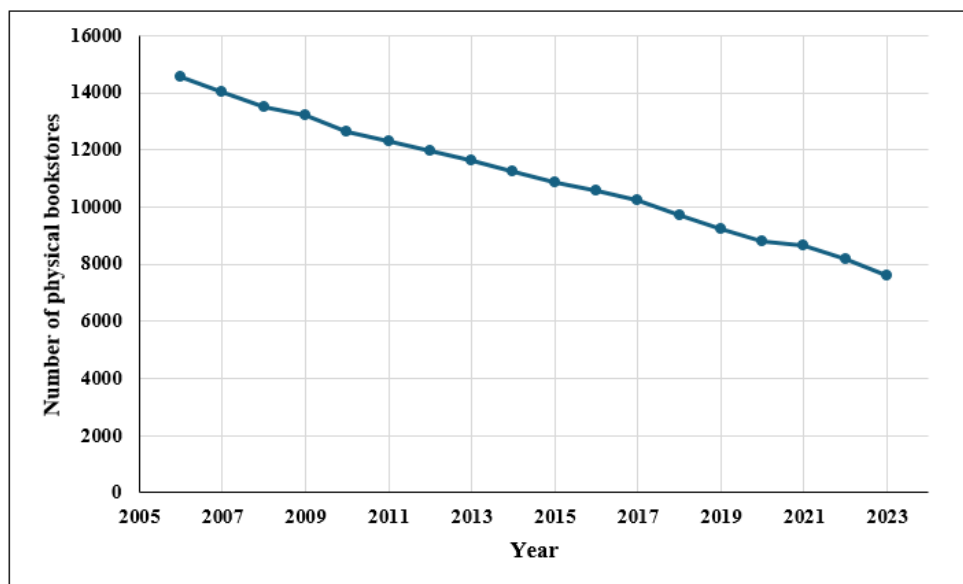


Figure 1 Change in the number of physical bookstores with time

Data were obtained from the latest edition (2024) of Nippan's (Nippon Shuppan Hanbai) publication sales. The figure is based on data from reference 7).

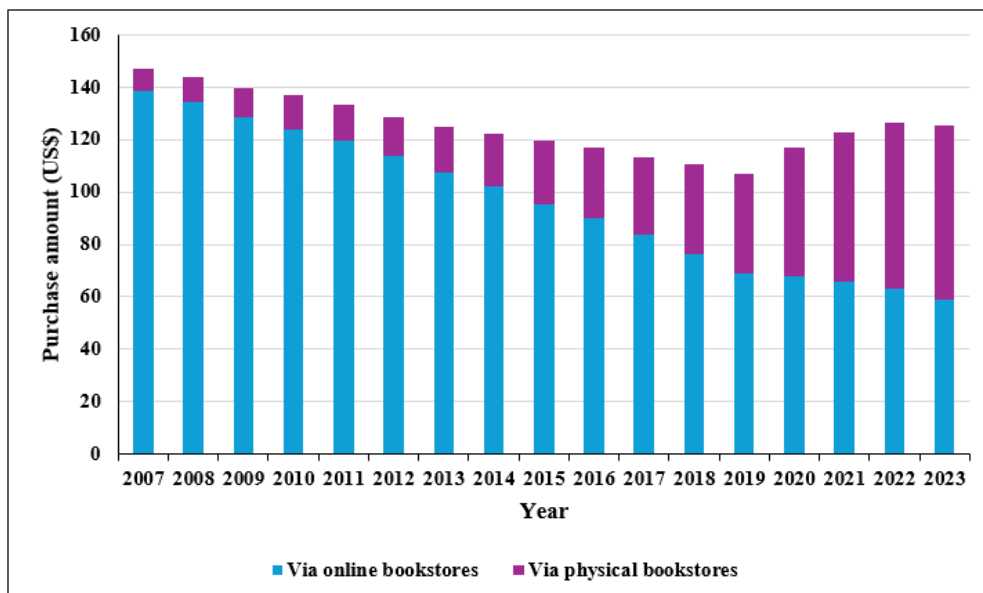


Figure 2 Changes in sales of physical bookstores and online bookstores

Publications sold online do not include e-books or academic journals.

Publications sold in physical bookstores include sales at physical bookstores, convenience stores, and other distributors.

Calculated based on the exchange rate during October 2025, at 1 USD = 150 JPY.

The figure is based on data from Reference 8).

Table 1 Characteristics of books and electronic books

Type of Feature	Book	Electric book (e-book)
Appearance of the book	The reading experience and book selection is influenced not only by the content, but also the font, illustrations, and cover (even the smell of the paper can be memorable). A person may start engaging with book they did not intend to read by merely picking it up (a stroke of serendipity).	By downloading data to an electronic device, a person can easily carry the book around without being concerned about thickness or weight.
About the purchaser/borrower	A book can be chosen in person at a store (a person may observe various features and ask staff for advice). Printed books are easier to pick up and more likely to connect with reading, especially for older adults and children. Second hand books can sometimes be purchased cheaply. Owning a printed copy of a book creates attachment (some people desire to keep it, whereas some borrow and read it without purchasing).	It is possible to purchase or rent e-books without visiting a store. It is possible to purchase online or view the outline (e.g., photos, table of contents). It is possible to zoom in and out, change fonts, and use a text-to-speech function. Used books have not been digitized. There are some opportunities to save money on purchasing new books (however, a separate device is needed download the data). Bulk purchases are easy because e-books only require data storage.
Sales, rentals, employee, and manager	Books help bookstores and libraries to persist and create jobs for their employees. Book-printing and -binding technology is believed to be able to evolve and be passed down.	Rentals offer mechanisms (such as data locking) to prevent a disc from being read beyond the contract period. E-books contribute to the elimination of wasteful use of paper and ink resources.
Other	A book can become a treasured or sentimental item to the purchaser. The binding and author's signature can affect the value of a book (positively or negatively). The printing year of a book and whether it is a first edition may be important for research purposes.	Easy to dispose of.

How to cite this article:

Jun Kobayashi et al. Ijsrm.Human, 2025; Vol. 28 (11): 19-24

Conflict of Interest Statement: All authors have nothing else to disclose.

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