

**Business model study of the EdTech market in private education
-Focusing on Japan and East Asian Countries**

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Abstract: The purpose of this paper is to examine business models of EdTech markets in the private education domain in Japan and East Asian countries. Specifically, this paper discusses how to create innovation to establish EdTech services, the business model of leading EdTech firms, and challenges of EdTech services, focusing on similarities and differences among educational environments and markets in East Asian countries. As a result, it is clear that the construction of an "educational ecosystem" that integrates physical and digital technologies where platform providers and content suppliers coexist and prosper together, is effective for the development of EdTech services.

Keywords: EdTech, business model, disruptive innovation, platform, ecosystem

1. Introduction

The global EdTech¹⁾ market is growing rapidly, driven by the advancement of digital technology and the Corona Disaster. The global EdTech market size is projected to be \$89.49 billion in 2020, with the compound annual growth rate of 19.9% from 2021 to 2028 (JETRO, 2021).

The scope of this paper is "private education" in East Asian countries (Table 1) which is distinct from "public education" (school management such as elementary, middle and high schools), and focuses on educational services and their business models utilizing EdTech which has been growing rapidly in recent years.

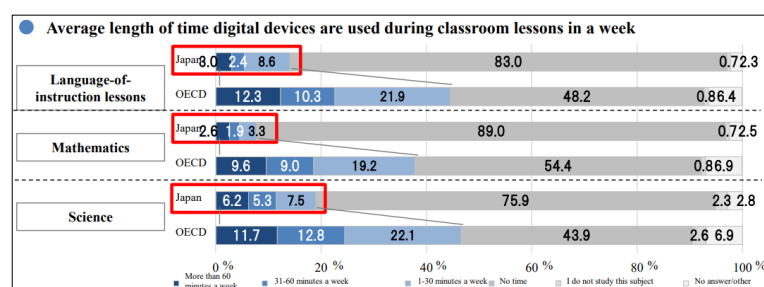
Unlike Western countries, East Asian countries have in common that competition for admission to higher education institutions is fierce and that educational services which provide supplementary learning around schooling and learning materials are extensive (Sakai, 2013).

Table 1: Classification of education-related businesses

public education	private education	
school administration	supplementary curriculum	Auxiliary materials, test administration, etc.
Higher education: Operation of universities, graduate schools, vocational schools, etc. Secondary education: Operation of junior high schools, high schools, etc. Pre-school: kindergarten, etc. – Primary education: elementary school management [Providing of public goods]	Operation of cram schools Operation of tutoring cram schools Operation of a certification and examination preparation school Providing tutoring services [Providing a place and people]	Teaching materials, textbooks, dictionaries, etc. Publication of Provision of mock examinations and certification tests Learning and testing systems Provision of [Providing goods and things]

Source: Prepared by the author based on Sakai, Michiyo (2013), "Overall picture of the global education industry," p6.

However, the Organization for Economic Cooperation and Development (OECD) published in 2018 (Figure 1) the results of its "ICT Use Survey" which showed significant differences in its findings among East Asian countries. In this survey, which covered 15-year-olds, the equivalent of first-year high school students in Japan, Japanese students spent the least amount of time using digital devices in school, the lowest among OECD member countries. Japan's teachers' ICT skills also sank to the bottom of the list among OECD countries. On the other hand, those countries and regions such as China, Taiwan, and South Korea which ranked higher than Japan, were found to be advanced countries in the field of digital utilization in education.



Source: Key Features of OECD Programme for International Student Assessment 2018 (PISA2018), p10

Figure 1: Use of Digital Devices in Schools and Out-of-School Settings in Japan

Although EdTech has attracted a great deal of attention in practical terms, academically it is a developing research area and there is a lack of research accumulation (Yamamoto, 2021). It has also been pointed out that the education industry has a large public role, and the scope of participation by for-profit companies is limited, resulting in a lack of research accumulation (Sakai, 2013).

In this paper, we also focus on this research gap, and our objective is to examine business models

for educational services utilizing EdTech which is growing rapidly in East Asian countries.

Specifically, we will examine the process of the emergence of EdTech from the perspective of the "innovator's dilemma" and "disruptive innovation" (Christensen,1997) paying attention to its uniqueness as the education market and the similarities and differences among East Asian countries, and will clarify from case studies that the business model in the education industry is transforming with the emergence of EdTech. In addition, through case studies, we will clarify that the successful model lies in the formation of an ecosystem (Iansiti and Levien,2004), as well as the challenges of EdTech services.

The structure of this paper is as follows. Section 2 confirms the particularities of the education market under study and the similarities of the educational environment in East Asian countries, organizes previous studies on EdTech, and points out their challenges. Section 3 uses "disruptive innovation" to examine the process of EdTech's emergence. Section 4 discusses case studies of Japan and China which have established EdTech business models ahead of other countries, and clarifies that business models in the education industry are changing. It also reveals that the successful model lies in the formation of an ecosystem (Iansiti and Levien,2004). In Section 5, based on the results obtained from interviews with Japanese educators, we clarify the challenges in developing EdTech. In the subsequent section 6, we discuss the theoretical implications and practical implication of this paper.

2. Review of previous studies

2.1. Research on the characteristics of educational markets in East Asian countries

Educational services are subject to the educational policies and regulations of national governments and cannot compete under perfect market principles (Jiang, 2019). Therefore, unlike in Western countries, the education business in Japan and other East Asian countries is conducted by non-profit organizations in the area of public education. In addition, the highly competitive entrance examinations for higher education and academic achievement tests have led to the development of the private education sector in the areas of supplementary learning, teaching materials, and test administration which has contributed to increased demand (Sakai, 2013). Mark Bray (2012) also reports the results of the survey on the revitalization of educational services around schools (Shadow Education) which can be said to be unique to Asia.

Private education, such as supplementary learning, teaching materials, has grown common to East Asian countries, but in recent years, the use of EdTech has led to the emergence of players that did not exist before, overseas expansion of their own businesses, collaboration among companies, the creation of ecosystemized business models (Okano,2017) , and the development and spread of online education and LMS (Learning Management System). Thus far other methods of learning have been developed and are becoming more widespread (Sato, 2018). The emergence of EdTech is forcing the transformation of business models in the education industry. Analysis of EdTech development cases in East Asian countries where the use of digital in education is advancing and market environments have high affinity, should contribute to the companies that follow.

2.2. Research on innovation leading to EdTech

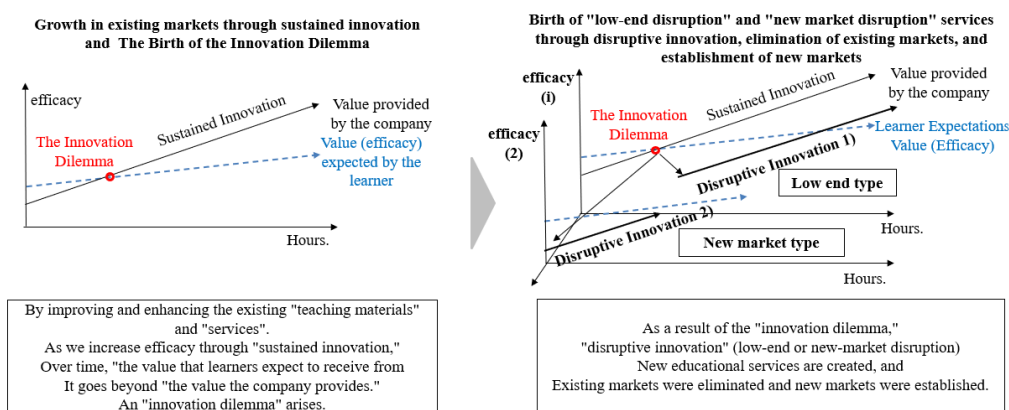
Christensen (1997) called the "Innovator's dilemma" ²⁾ the phenomenon in which companies focus so much on product improvement to protect existing businesses, technologies, and markets that they fail to recognize changes in customer demand and preferences, and are defeated by startup companies born through heterogeneous technological innovation. Toyoda (2021) reconsidered this "Innovator's dilemma" from the viewpoint of "value factor = objective" and "value provided = means. To use this theory as an aid, the dilemma is that "the corporate effort to make a certain value offering = means better exceeds the required value element = purpose, making the value offering obsolete. One way out of this dilemma is "disruptive innovation" (Christensen, 1997).³⁾

EdTech was born after Christensen formulated the "disruptive innovation" theory, but the mechanism by which traditional educational services are disrupted and new educational services are created in the process of establishing EdTech is supported by the "disruptive innovation" theory. EdTech is an educational service created by "disruptive innovation" through heterogeneous technological innovation in the education market which has been growing through "sustainable innovation" focusing on product improvement to protect existing businesses, technologies, and markets. The mechanism is summarized in Figure 2.

First, performance improvement in educational services proceeds at a faster pace than the increase in value (efficacy) expected by learners. Educational services have developed through "sustained innovation" based on the premise of providing the single teaching material or service content suitable for simultaneous or face-to-face learning (Figure 2 left). In recent years, however, "disruptive

innovation (1)" has emerged as the service that provides personalized learning (Figure 2, right). The first is "Low end type" which is designed to attract customers from the existing market. This is the innovation that provides inexpensive services with new value (efficacy), although they are inferior to existing educational services in terms of the main value elements that appeal to customers. This is the innovation with new value in that classes and lectures which were previously offered only to the person or in the classroom. It can be now viewed at any time and any place through the distribution of class videos. This is the "disruptive innovation" that has revolutionized the structure of educational services based on the premise of simultaneous face-to-face learning.

The other type of innovation is called "New market type" in which a new value element different from existing educational needs is provided to attract new customers. This is the innovation with a new value element, in which classes with common content and progression are optimized for each student through learning management. This is another "disruptive innovation" that changes the structure of traditional educational services. The commonality of the both "disruptive innovation" is that innovation cannot be achieved by focusing only on the value elements currently being promoted in the education market (Toyoda, 2021). This suggests the need to consider what new value and value elements can be offered in the provision of EdTech.



Source: Prepared by the author based on Clayton M. Christensen and Michael E. Raynor (2003), Solutions to Innovation, p55.

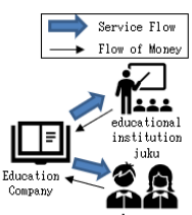
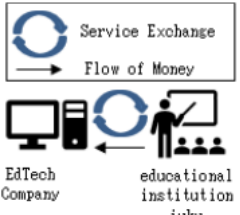
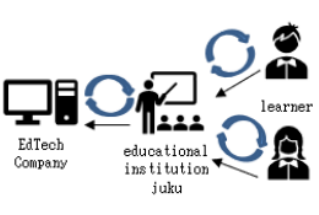

Figure 2: Theory of "disruptive innovation" in the education marketplace

2.3. Research on business models of EdTech companies

Originally, as shown in Table 2, the education market generally had the one-way business model

in which education companies provided teaching and learning tools and materials to be used by school and learners. However, with the advent of EdTech, a different business model is now emerging. Sakai (2020) newly classified the business models of EdTech companies into the "Supportive Type" for school and the "Platform Type" and "Integrated Type" for learners. On the other hand, that classification did not organize down to business model, so to add that element, the "Supportive Type" for "for Schools" is the BtoB (Business to Business) model in which EdTech companies provide services to and interact with schools and cram schools, etc. On the other hand, the "Platform Type" of "for learners" is the BtoBtoC (Business to Business to Consumer) model. EdTech companies provide platforms that are used by educational institutions and learners to interact with each other. The "Integrated type" of "for learners" is the BtoC (Business to Consumer) model which is an integrated business model that handles not only the platform for learners but also the production and provision of content for learners to use.

Table 2 Major business models of EdTech Companies

For Schools	For learners	For Schools	For learners	
Provider Type		Supportive Type	Platform Type	Integrated Type
B to B	B to C	B to B	B to B to C	B to C
EdTech companies provide teaching tools and learning materials that are utilized by schools and learners.		EdTech companies provide services and content that educational institutions utilize and exchange content.	EdTech companies provide a platform for educational institutions and learners to utilize and exchange content.	EdTech companies provide the platform and even produce and provide the content, and exchange content.
Teaching Tools, Textbooks, teaching materials, etc. 	School Administration Support Tools, LMS, Digital textbooks and teaching materials. etc. 	Google Workspace for Education, Microsoft Office 365 Education, etc. 	Atama+, Study Supplement, etc. 	

Source: Prepared by the author based on Sakai, Michiyo (2020), "Growing Expectations for EdTech with the

Corona Disaster - An Anticipated Paradigm Shift in Learning," p2.

The "Supportive Type" EdTech for "Schools" includes school administration support tools for managing student attendance and grades, LMS for managing progress and submission of homework and assignments, digital textbooks, and digital educational materials.

On the other hand, the "Integrated Type" EdTech for "learners" has been mainly utilized as supplementary materials in the private education field, aiming to attract learners in areas where there are not enough cram schools or private tutors. However, with the Corona Disaster, "integrated" EdTech "for learners" began to be used by public educational institutions as "platform-type" EdTech, and is now providing personalized educational content using AI (artificial intelligence) and other advanced technologies. The "Integrated Type" EdTech for "learners" has changed the value chain, and those marketing and services from EdTech companies to learners have shifted from a "one-way" to an "interactive" type of marketing and services, and it has also become an opportunity to establish a new business model from a "one-to-one" type to a "one-to-many" type.

Kuriki (2022) cites Recruit's "Study Supplement" as the successful example of EdTech that started as the "integrated" service "for learners. He points out that the change of direction of "Study Supplement" which started as the BtoC service for individuals into the BtoBtoC service for school, has led to its current growth .⁴⁾ This explains that business models in the education industry can be developed simultaneously.

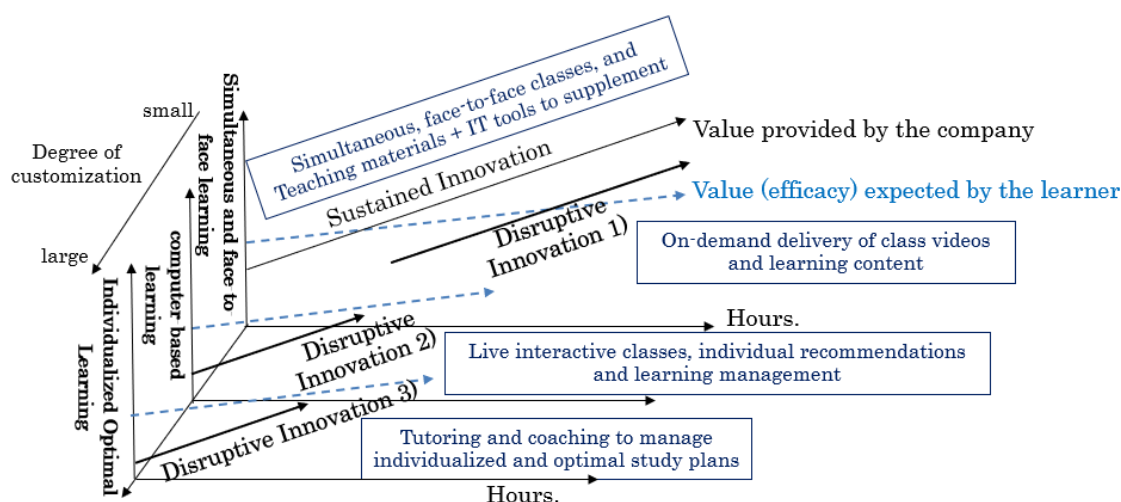
3. Consideration of EdTech services through "disruptive innovation"

Figure 3 illustrates the mechanism of "disruptive innovation" currently occurring in the education industry. Sustained innovation" in the education industry is innovation that strengthens the efficacy of existing products through the use of IT tools to supplement simultaneous, face-to-face instruction and teaching materials. The traditional educational material manufacturers have increased the value of their offerings by providing the value and materials that their existing customers expect.

On the other hand, the "disruptive innovation" in education can be described as adaptive learning through interactive online classes and individual optimization. As a result, low-end "disruptive innovation (1)" occurred, disrupting the sustained innovation that had supported the growth of the education industry up to the present. Furthermore, with the advancement of digital and telecommunication technologies, online interactive classes, LMS, and AI-based individual recommendation and learning management became possible, and computer-based learning that does not rely on simultaneous or face-to-face learning through physical places and people was born. Computer-based learning is a new learning method that does not rely on physical, human-mediated, simultaneous, or face-to-face learning. Computer-based learning is the different efficacy measure

than either persistent innovation or low-end "disruptive innovation (1)". It created a new market and caused the new market-type "disruptive innovation (2)".

However, computer-based learning also ran into the "Innovator's dilemma (Christensen,1997)" of "learning becomes passive and ineffective only with the evolution of ICT. Therefore, tutoring and coaching services were developed as individually optimized learning in which ICT is used to present individualized and optimal learning plans, while "places" and "people" supplement the management of learning progress. Individualized learning disrupted the market for computer-based learning, created the new efficacy scale, and triggered "disruptive innovation (3). The current education market is undergoing "customization" as a result of disruptive innovation.



Source: prepared by the author based on Christensen (2008) "Education x Disruptive Innovation" p49

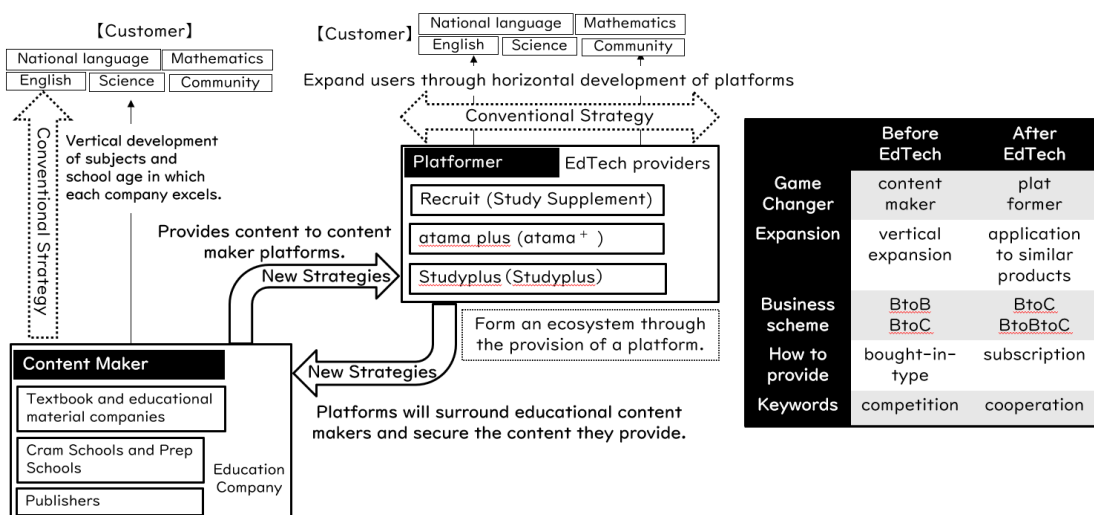
Figure 3: Mechanisms of "disruptive innovation" in the education industry

4. Consideration of business models after the emergence of EdTech

4.1. Strategic Direction of EdTech Companies

In the past, the education market was mainly the BtoB or BtoC model in which individual educational content manufacturers expanded their customer base through vertical development by offering educational materials on a buy-one-get-one-free basis for the subjects, subjects, and age groups in which they specialize (Figure 4). However, with the progression of disruptive innovation, the variety of EdTech companies, ranging from major companies to start-ups, have begun offering educational platforms in BtoC and BtoBtoC model. These platforms are characterized by the fact

that they contain cross-curricular learning content rather than learning content for specific subjects. While educational materials have generally been provided on a grade-by-grade basis in the past, these platforms allow students to utilize learning content without the concept of grade or school age. Also these platforms have begun offering the service on a subscription basis. As a result, the need for users to have learning content for each subject area diminished, and users were able to relearn and advance their studies across grade levels and school years, and the platform expanded its user base through horizontal development. Platformers are forming an ecosystem (Iansiti and Levien,2004) for their services, and are adopting a strategy to secure superiority as the platform by enclosing the content of content makers who have been in the competitive relationship with them in their platforms. Content makers are also adopting strategies to survive as content providers by offering their content to platforms.



Source: Prepared by the author based on Okano, Toshihiko (2017), "【Case Study 1】 Founding Platforms in the Internet Education Market, Competitive Strategies of Education Providers and Entry Strategies and Founding Environment of Venture Businesses: first part" Management Research Institute Report, p. 8.

Figure 4: Pre- and Post-EdTech Strategic Directions for Japanese Education Companies

Similar events can be seen not only in Japan but also in China where EdTech platform providers have enclosed content suppliers on their platforms to ensure the diversity and quality of content, and have increased the attractiveness of their platforms and driven the advancement of EdTech (Okano, 2017). In China's education market, individual education providers had been vertically expanding

their customers in the subjects and school years in which they specialize, but against the backdrop of the huge population and online education users⁵⁾, the major Internet service providers established the huge EdTech platforms were built to expand users through horizontal expansion, creating an environment similar to that in Japan where content from various educational providers can be provided to users from the platform. Okano (2017) points out that the major Internet service providers that became EdTech platform providers surrounded educational content suppliers on their platforms, ensured the diversity and quality of content, increased the attractiveness of their platforms, and led the advancement of EdTech in China. In the Chinese education market, we can see that platforms are having a significant impact on the transformation of business models.

Thus, the traditional business model of the education market in East Asian countries has changed since the emergence of EdTech which was created through disruptive innovation and the provision of platforms by EdTech companies. To ensure the dominance of their platforms, platforms and content makers are cooperating to form the ecosystem (Iansiti and Levien,2004) strategy.

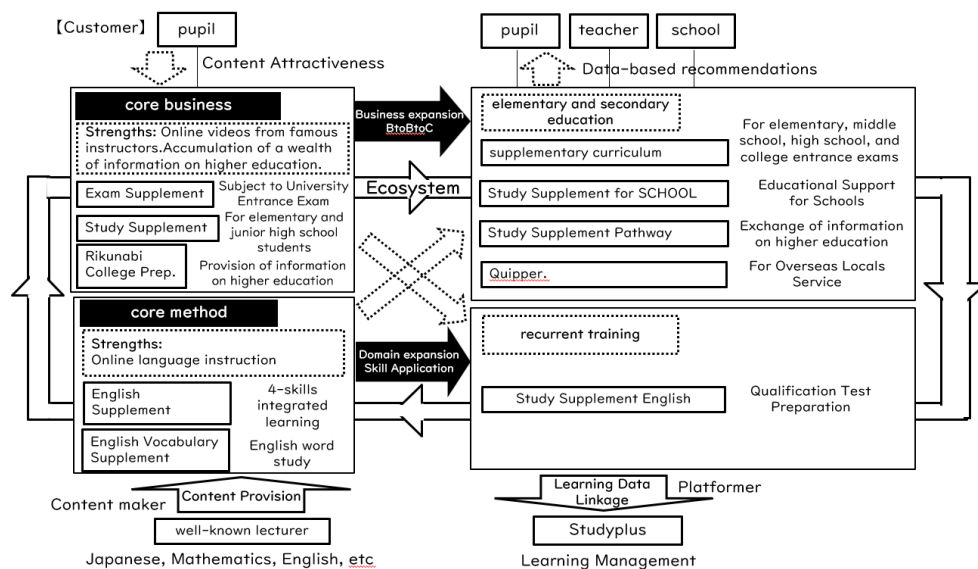
4.2. Model for building an educational ecosystem

Recruit is the major media company that provides information on university entrance, and its strength is its big data accumulated through information requests, as well as its know-how in career development support. On the other hand, in developing EdTech which started from the question "Isn't academic achievement improvement the essential issue for students?", the name of the service was integrated into "Study Supplement (Figure 5)" which covers everything from career path selection to academic achievement improvement, and the target grades were expanded from elementary school to university entrance examinations. In converting the accumulated data that had been dispersed among the individual services from BtoC to BtoBtoC, the data was compiled into a form that is easy for teachers and learners to use and utilized to create the new EdTech.

Recruit have also begun exporting the online learning methods developed through "Study Supplement" to overseas markets. In the area of recurrent education, which is becoming increasingly important with the expansion of services to emerging educational countries and the development of a global society, the company is expanding its business domain with English qualification test preparation services. In developing the service, the company is working on measures to increase the added value for users in the learning management function by providing the variety of study videos

on the "Study Supplement" educational platform, featuring famous instructors on various subjects, and by linking the data collected through "Study Supplement" on learning and schools of interest to the competing platform "Studyplus". The company is also working on measures to increase the added value for users in the learning management function. "Study Supplement" is forming the ecosystem (Iansiti and Levien,2004) based on its own platform, and is expanding the use of its educational platform not only in the field of private education, but also in the field of public education.

Recruit utilized its pulling power, analytical capabilities, and big data as a college information site to provide a wide range of educational content that it did not have in-house, and strengthened ecosystem (Iansiti and Levien,2004) formation by collaborating with rival platformers. By providing educational services through its integrated educational platform, the company demonstrate its "network externalities" (Tanaka, Yasaki, Murakami,2008) as a platform and work to set the industry standard in educational platforms, from primary and secondary education to recurrent education. In the educational platform, this also confirms the fact that the content and services will be enhanced by attracting more users, and that users will gather where the content and services are enhanced and the convenience of the services will be enhanced.



Source: Prepared by the author based on Okano, Toshihiko (2017), "【Case Study 1】 Founding Platforms in the Internet Education Market, Competitive Strategies of Education Providers and Entry Strategies and Founding Environment of Venture Businesses: first part" Management Research Institute Report, p. 11.

Figure 5 Recruit (Study Supplement) Mechanism of "ecosystem" formation

The similar ecosystem-building model can be seen in the Chinese education market. Baidu, China's largest search engine company, has strengths and characteristics in content and technology accumulated through its search engine. Specifically, by combining the content accumulated through its "Baidu Knows" search engine, "Baidu Baike" knowledge site, and online encyclopedia site, with technology honed through its search services, the company is developing homework support sites for elementary and middle school students and comprehensive school education support services, while the company is also expanding its business domain.

Baidu has formed the ecosystem (Iansiti and Levien,2004) by receiving content from content suppliers for its education platform which can utilize the content accumulated in its core search business and its core search technology. Similar to Recruit, the company started with the matching service that introduced educational content and services by leveraging its strength as the search engine, technical capabilities, and accumulated volume of information, and expanded its business by leveraging the strengths and characteristics of each service and content. The company then strengthened the formation of the ecosystem (Iansiti and Levien,2004) by securing content that it could not provide on its own as educational content for its platform by investing in educational service providers. The mechanism of ecosystem (Iansiti and Levien,2004) formation in the platform business observed EdTech firms in East Asia may serve as the case study for educational firms when they consider ecosystemized business models (Okano,2017) in the future.

4.3. Service Offerings in EdTech Challenges

Another trend seen in East Asian countries in recent years in the field of EdTech services is the expansion of the scope of EdTech utilization. Specifically, the introduction and use of services is expanding from "private education and supplementary learning" to "public education" mainly in collaboration with schools. Traditionally, EdTech introduced in public education has focused on services and contents in which LMS is implemented and utilized by business-to-business operators. However, EdTech is now being used in public education not only for the purpose of reducing teachers' school workload and unifying learning management, but also as the tool for optimal individual learning that cannot be handled by whole-class instruction alone, or as supplemental or supplementary materials to various class contents.

On the other hand, in China and South Korea where the digital shift in the education field is more

advanced than in Japan, EdTech, which started as a BtoC service, is expanding into the service format called "tutoring-type service" which is unfamiliar in Japan. In East Asian countries where EdTech has spread more quickly and widely, some of the challenges of EdTech have been pointed out. The most serious problem is that "learning with EdTech is passive, and a certain number of students withdraw from the learning process". The countermeasure to this problem is the "tutoring-type service" which is the "fusion of physical and digital" with a system that allows students to manage their learning through tutors and to ask questions immediately on points that are unclear in their learning. Such services are leading the way in East Asian countries where the use of digital technology in the education field is leading the way. While EdTech continues to evolve with the advancement of technology, leading EdTech companies have demonstrated the new form of successful EdTech services: the "fusion of the Internet and the real world. The "fusion of the Internet and the real world" is a form of provision that has been able to address the challenges of EdTech services that have been encountered because the services have spread more quickly and widely.

5. Challenges and solution directions by stakeholder in EdTech

While the learning brought about by EdTech will bring about a new educational market, moving from simultaneous, face-to-face learning to individualized, optimal learning, and combining physical and digital learning, interviews conducted with Japanese educators revealed that there are also new business issues to be solved (Table 3).

Learners are required to have a learning environment and the literacy to use the services when utilizing EdTech. Another issue is that learning through EdTech tends to be passive, and motivation may not be sustained if only individually-optimized content is presented. There is a concern that instructors may experience large gaps in instruction due to factors such as proficiency and responsiveness to EdTech. New instructional skills are required, from teaching to facilitating and coaching, and it is expected that they will be used more effectively according to the content and purpose of instruction. Education providers will be required to develop the environment, security, and rules for both learners and instructors. They are also expected to establish management methods when using multiple EdTech and to create databases of learning logs and other information generated by the use of EdTech. Educational companies will need to develop new technologies because the content and delivery methods of EdTech are different from those developed for conventional services.

As a result, they must be prepared for sales dispersion from conventional services, rising development costs. The effective use of user performance data obtained through the use of EdTech is also expected to lead to the brushing up of the services provided.

While providers are required to solve issues arising from the use of EdTech, the interviews with stakeholders also indicated a direction for solutions. For learner issues, it is the development of physical and digital fusion services that combine human-mediated systems and EdTech.

In parallel with the advancement of EdTech, companies are required to establish a mechanism to manage learning and resolve uncertainties in learning. To address the issue of instructors, it is important for EdTech providers to follow up on the use of EdTech. It is important to create effective use cases so that not only learners but also instructors can use EdTech to reduce their workload and improve the efficiency of instruction. For educational institutions, it is important to consider the data utilization that will result from the use of EdTech. It is expected that the analysis of the educational data obtained will be expanded from the individual to the whole, leading to the discovery and resolution of issues for the entire school and the entire municipality.

Table 3: Issues to be solved in the use of EdTech by stakeholder group

STAKEHOLDERS	PROBLEM TO BE SOLVED
LEARNER	<ul style="list-style-type: none"> • Preparation of learning environment (hardware and infrastructure) • Literacy on various EdTech • Management of different IDs and passwords for each EdTech service • The motivation to learn does not continue if only individually-optimized problems are presented.
INSTRUCTOR	<ul style="list-style-type: none"> • Increased disparity in instruction between instructors • The burden of preparing for classes. Difficulty in changing the way of proceeding. • Acquisition of new skills such as facilitating and coaching rather than teaching • More effective use of EdTech according to class content and instructional objectives
EDUCATION PROVIDER	<ul style="list-style-type: none"> • Improvement of the environment for learners and instructors (hardware, software, and infrastructure) • Establishment of security environment and rules • Management of multiple EdTech when utilizing multiple EdTech • The creation of educational databases generated by EdTech.
EDUCATION COMPANY	<ul style="list-style-type: none"> • Need for new technological development and new services • Sales dispersion, rising development costs, and the emergence of new disruptors • Utilization of obtained educational performance data • Unify tag information for learning content that differs from company to company

Source: Prepared by the author from interviews with Japanese teachers, educational institutions, and educational companies (2022)

6. Discussion and Summary

6.1. Findings

In this paper, we examine the business model for education services utilizing EdTech which is growing rapidly in Japan and other East Asian countries, and clarify the following.

First, we first identified that East Asian countries, including Japan, are under a common educational environment and that educational services around schools at the primary and secondary school ages are activated. The education market in East Asian countries is "under the common environment of East Asian countries" against the background of intense competition for admission to higher education and the existence of accompanying achievement tests. We explained that companies providing private education services such as supplementary learning, teaching materials, and test administration, which have grown in this environment, have recently been forced to consider building the business model that go beyond the conventional goodness of content and service content through the use of EdTech. In East Asian countries where the use of digital technology in the education field is particularly advanced, we explained that not only the sophistication of EdTech, but also the maximization of learning effects through mechanisms are being sought, and the expansion of EdTech services is being promoted through the fusion of physical and digital technologies.

Next, analyzing the case study in this paper from the perspective of Christensen's disruptive innovation, we found that EdTech was not an extension of existing educational services and needs, but was established by disrupting them or launching a completely new efficacy. We found that two types of disruptive innovations, low-end and new-market innovations, are generated by EdTech in the education market which has grown through sustained innovation pursuing the efficacy of simultaneous, face-to-face learning, and we found a mechanism by which traditionally supported efficacy is replaced by a new efficacy and customization is progressing.

Furthermore, in considering the business model of EdTech, we clarified that the formation of an ecosystem (Iansiti and Levien,2004) in which platformers and content makers coexist and prosper together is effective for corporate growth. As examples of ecosystem (Iansiti and Levien,2004) formation in the education industry, the paper discusses the case of Recruit in Japan and Baidu in China, and explains the mechanism of ecosystem formation in the platform business.

Finally, we clarified that the fusion of physical and digital technologies is effective in solving issues for learners, instructors, and educational institutions. In countries with advanced utilization of

EdTech, it has been pointed out that “in learning with EdTech, learning becomes passive and some students have begun to withdraw from learning. As a response, we pointed out that the fusion of physical and digital technology is the new form to overcome the challenges of EdTech. In addition, we presented that the learning brought about by EdTech has created new challenges for learners, instructors, educational institutions, and educational companies, and indicated the direction of solutions by EdTech companies for each stakeholder.

6.2. Theoretical and practical implications

As the results of this paper, we would like to present theoretical and practical implications. First, regarding theoretical implications, as a study of the business model for EdTech services, the mechanism by which EdTech was created was clarified from the perspective of Christensen's disruptive innovation. The paper pointed out that EdTech are not an extension of sustained innovation in line with existing educational needs such as simultaneous face-to-face learning, but are created through repeated disruptions caused by low-end and new market-type educational needs. This is a contribution of this paper to existing innovation research. Another point is that EdTech which was created through disruptive innovation, has changed the traditional the business model (Okano,2017) and revealed the mechanism of “educational ecosystem” formation. This is a contribution to research in the field of EdTech where there is little accumulated research on the ecosystem (Iansiti and Levien,2004) that are currently being formed in various industrial fields.

Next, as a practical implication, the paper showed content makers and platform providers involved in EdTech how they should utilize their own content, core businesses to form an ecosystem (Iansiti and Levien,2004). This paper can be used as a case study for educational companies when considering an ecosystemized the business model (Okano,2017). In addition, based on the results of interviews with educators, the paper presents the issues that arise from learning brought about by EdTech for each stakeholder and the direction in which EdTech companies can solve these issues.

7. Conclusion

In this paper, we explained that the “innovator’s dilemma” shown by Christensen (1997) arose even in the education industry which has grown through sustained innovation, and that EdTech was established through “disruptive innovation”. The EdTech has also changed not only the content of

services from traditional educational services, but also the business model in the education industry as demonstrated by Sakai (2020) and Okano (2017). As the business model utilizing the EdTech, we clarified that it is effective to build the “ecosystem “ (Iansiti and Levien,2004) in which platform providers and content suppliers coexist and prosper by leveraging “network externalities” (Tanaka, Yasaki, Murakami,2008). On the other hand, the limitations of this paper should be pointed out: EdTech services have only been in existence for a short period of time, and it is difficult to say that sufficient materials and business models have been accumulated by companies, so it takes time to verify the versatility of the business model. In addition, due to the nature of the industry which deals with services similar to public goods such as education, the effectiveness of such services is also a major issue, and verification of the effectiveness of such services is not something that can be achieved immediately after their use which also requires time. In order to verify the effective business model of EdTech companies, we would like to continue to accumulate case studies and to continue to observe the effectiveness of the services provided by EdTech companies in order to find their universality as the future research topic.

Annotation

- 1) EdTech is a term coined by combining "Ed" in "Education" and "Tech" in "Technology." It indicates various learning tools and services that support education by using digital technologies and techniques such as online education, AI, AR, and VR.
- 2) Clayton M. Christensen (1997), "The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail," Harvard Business School Press.
- 3) Clayton M. Christensen, Michael B. Horn & Curtis W. Johnson (2008), "Disrupting Class: How Disruptive Innovation will Change the Way the World Learns," McGraw-Hill.
- 4) Recruit Holdings "Annual Securities Report for the Fiscal Year Ended March 31, 2021" (p.49) announced that the number of paying members of Study Supplement as of the end of March 2021 was 1.57 million, an increase of 97.4% from the end of the previous fiscal year.
- 5) According to a survey by the Japan External Trade Organization (JETRO) (2021), the number of online education users in China was estimated to be 381 million as of March 2021 (accounting for 40.5% of all network users).

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