What is Education for the 21st century? – The Singapore Experience

by Fei Chen Lee

Chapter 2

ABOUT THE AUTHOR

Fei Chen Lee

Fei Chen Lee is currently the Senior Advisor to Times Publishing Group. She was Head of Publishing of Marshall Cavendish Publishing Group from 2008 to 2019 and was responsible for formulating and implementing strategies to grow the Group's publishing operations worldwide.

Fei Chen has been with Times Publishing Group for over 20 years and has worked in its publishing businesses in Singapore, Hong Kong, Malaysia and Thailand. She was instrumental in setting up Times Publishing Group's electronic publishing business.

Prior to that, she worked at the Ministry of Education, Singapore, and as a lecturer in Hong Kong. Fei Chen obtained her Masters in Education at Harvard University on a Singapore Government Scholarship.

WHAT IS EDUCATION FOR THE 21ST CENTURY? – THE SINGAPORE EXPERIENCE

CONTENTS

EXECUTIVE SUMMARY

With an internet penetration (by mobile) of over 75%, Singapore is a truly digital nation and its government demands an education system that fully reflects this. But it has not always been that way. It had traditionally suffered from low levels of literacy and high ratios of pupils to teachers, with textbooks imported from the UK.

However, after gaining its independence in 1965, the Singapore government recognised that it needed skilled labour in manufacturing and its education system was initially set up to cater for such skills.

Manufacturing developed into engineering and electronics but by the 1980s professional service were forming the basis of the economy, with a national aspiration of attracting overseas investment and a newly skilled workforce. English became the medium of instruction and new curricula were introduced. However, the teacher workforce had still not professionalised and needed extensive support.

It was at this time that the Ministry of Education (MoE) in Singapore set up a modus operandi that continues today. Its textbook division works with publishers to develop Singaporean textbooks, workbooks and teacher guides. This partnership has taken various guises for different subjects but with the combined objective of producing content that was credible and of a superior standard. In the late '80s, as Singaporean publishers started travelling to overseas bookfairs, the content went from being solely for a domestic audience to being licensed for global use.

Singapore today is proud of an education system that has been robustly reviewed and critiqued. It keeps the textbook at the heart of teaching, whether in print or digital format. Recognising that the users of the 21st-century textbooks are digital natives and will not be engaged with simple "text on a page", teaching and assessment methods have changed, and the Singapore textbook of today incorporates augmented reality, weblinks for audio/visual content and animation. Apps and

tools will often accompany the textbook. These changes come as the MoE places increasing emphasis on digital learning, ensuring that the content is engaging as well as educational and supporting publishers with digital development through grants and projects. Today's textbook must be "SMART" to gain MoE approval for use.

This new way of producing textbooks brings its own challenges to publishers who now need to be licensees, procuring content from other sources, as well as licensors. Authors and publishers need to be creative as well as factually accurate. Textbook production now requires conceptualisation, robust thinking and planning; it can take a team of 30 people approximately 2 years to produce one textbook, involving the author, editor and digital and art departments. When complete, the publisher must develop ways to maximise access to its content, both domestically and internationally. This involves additional risk, both maintaining the integrity of the content (and the author's and publisher's reputation) and also in collecting revenues from overseas partners. Neverthess, the ultimate goal of every educational author and publisher is that the content should be used by as many teachers and learners as possible.

Singapore is a success story of how government, creators and publishers can work together to create exemplary teaching and learning content. However, this is only possible if the roles of creators and publishers are valued, supported and remunerated adequately. When they are, governments, parents, teachers and learners can raise a generation of educated global citizens equipped with independent thinking skills who have a clear sense of right and wrong ■

1 INTRODUCTION: PROGRESS AT BREAK-NECK SPEED

The 21st century is indeed an exciting era for us. This is a period where progress in technology is growing exponentially, and there is an endless supply of information being shared continuously and instantaneously, at a speed unseen and unheard of. We live in a time where we can be witness to an event happening in any part of the world as long as there is satellite broadcast. We in Singapore saw the new year celebrated in Sydney, Australia (3 hours ahead), Tokyo, Japan (1 hour ahead), before we celebrated with the rest of South East Asia, and then continued the celebration in London, England and New York, United States, the following day. On a less happy note, we can also see wars and acts of cruelty being waged in real time.

Many of the scenarios that we had read about as kids or could only imagine are now a reality. The Internet has made it possible for people to make any statements they like on any topic and freely post any form of information. They may or may not be the specialists or experts in their subject, but they believe they can comment on any of the topics being discussed. Social media and its various platforms have empowered the ordinary person to pose as a figure of authority if they wish to do so, and, as most of us are aware, it is very easy to copy and paste or forward any information that lands on our devices. How many of us have received pieces of news from our friends only to have someone say later that the information was inaccurate and posted by pranksters?

The Department of Statistics, Singapore cites our population at 5.7m in June 2019 (Channel News Asia 26/9/2019) and the number of users who access the Internet via mobile phones is around 4.3 million. There are also claims that there are more than 5 billion mobile phone users in the world. This has given rise to much emphasis on technology in education and software engineering, but I think our concern should extend beyond that of creating the best hardware and software to feed the consumers. **The concern for the 21st century should be on our students and their ability to cope with the vast strides and progress made in technology.**

5.7m
people

4.3m
internet users

How do we prepare our students for such a world? How do we ensure that while they learn, they are not blindly accepting the information that is being fed to them? They will need to be discerning adults, to decipher and filter all the news and information they come across or are bombarded with. How do we ensure that they can make the right decisions based on the information given to them, since the information is freely available and there is freedom to comment?

When called upon to make decisions, do they do so based only on what the statistics tell them without further thought? Will they be influenced by the autobots to end up being a very efficient machine that can process and analyse information or make decisions based on facts alone, and lose the empathy, creativity and compassion that make them human? More importantly, can they tell right from wrong, and when necessary make the decisions that reflect a gracious and kind human race? If I may borrow and slightly adapt Charles Dickens, these are "the best of times and the worst of times", and we are facing the same breath-taking rollercoaster ride in education.

The evolution of education in Singapore from 1965 to 1990

At the risk of sounding like an old lady reminiscing about the good old days, I do think life — or rather, the goals in education — were simpler in the 1960s. Singapore gained its independence suddenly in 1965. We are an island with very few natural resources, no oil, no timber, no tin, and very little land for farming. Then, we had no option but to venture into manufacturing, producing goods for the rest of the world. For this, we needed skilled labour and priority was given to skills development, so technical and vocational schools were set up. A huge percentage of our population was illiterate, and we needed to educate them as quickly as possible, with the barest of resources, to create a productive and skilled workforce. It was a small group of literate people leading everyone else. The teacher-pupil ratio was 1:50. This was a period of survival; putting a roof over our heads and feeding the population were pressing issues.

Singapore's Ministry of Education (MoE), founded in 1955, decided to focus on skills, literacy and numeracy to cope with these new challenges. Being a former British colony, the basic texts were imported mainly from the United Kingdom. The idea was to teach as many students as possible in the shortest time. The people seemed to realise the urgency of the situation and were eager to be enrolled in schools and acquire new skills. By the 1970s, we had moved to industries which required skills such as precision engineering and electronics. There were factories that were assembling complex components for equipment such as television sets and fans. However, a mindset change was needed by the late 1970s as the other ASEAN countries were beginning to overtake us in manufacturing and production.

By the early 1980s we were venturing into the area of professional services. Our aspiration was to be a country of choice for global companies to invest in, but this would require a different breed of workers. We needed a workforce that was knowledgeable, competent in their skills, and professional. **Our motto going into the 1980s and 1990s was 'Thinking Schools, Learning Nation'.**

There was also a need to be proficient in English language and so English was used as the medium of teaching for all subjects. We needed new syllabuses geared towards the new needs.

By this time, most of the population realised what a valuable commodity education was. They had seen the significant gains made by many in social mobility through education and they wanted the same thing. The government too recognised the significance of having an educated population and yet resources in terms of qualified teachers were lacking.

Many teachers at that time were not graduates or specialists in their subject areas and had to teach several subjects. A graduate in English Language may have had to teach Geography or History as well. In Primary schools, teachers had to teach a core subject such as Mathematics or English and take on other non-core subjects such as Art or Social Studies. Most teachers, understandably, expressed a lack of confidence in teaching subjects that they had not specialised in. The MoE came up with a multi-pronged approach. While the National Institute of Education would train the teachers to teach the new syllabuses, the Textbook Division would work with publishers to equip teachers with the necessary teaching and learning materials. These came in a neat package: one textbook, one workbook and one teacher's guide.

Textbook publishing was introduced formally in the 1980s with the MoE working together with publishers to create our own Singaporean textbooks. The curriculum was drafted by the MoE and some textbook manuscripts were written by MoE officers as they were the subject specialists. Publishers were engaged to edit, design, typeset, print the books and distribute them. Different models were soon developed for different subjects — some textbooks were co-published by the MoE and the publisher; others were produced solely by the publishers with syllabuses provided by the MOE. In all these models, the objective was to introduce content that was credible and of a superior standard. These models served Singapore well and the textbooks were used only in Singapore. **It was only in the late 80's when publishers like Marshall Cavendish decided to participate in book fairs overseas, that Singapore's textbooks were exhibited and introduced to the rest of the world**. A common misconception was that the Singapore textbooks (written according to Singapore curriculum and used in Singapore) would not travel well, unlike the rest of the general and trade books. However, **education being a concern for most countries, Singapore textbooks were in much demand in many parts of the world. Requests for licensing came in and gradually, the scene for textbook publishing in Singapore changed** as well. Many publishers had to learn first-hand about the legality of content licensing as well as coming up with business models that would work for both licensor and licensee.

2 EDUCATION IN SINGAPORE IN 2020: CREATING THE IDEAL STUDENT

Fast forward to 2020. Singapore now has an education system that has been robustly reviewed, critiqued by many and adopted by some. **The textbook is still almost always seen as the base from which all teaching begins, be it in print or digital form**. In addition, we continue to emphasise skills such as critical thinking, communication, collaboration and creativity. The imparting, sharing and understanding of knowledge remains a vital requirement. With the rapid progress in technology and globalisation, there is now an urgent need to make sure that our students do not lack humaneness while acquiring the knowledge. In Singapore, we try to define what the ideal student would be, and this is how the Ministry of Education describes this student in its report on 21st Century Competencies[1]:

---

1   https://www.moe.gov.sg/docs/default-source/document/education/files/desired-outcomes-of-education.pdf

In sum, he [sic] is:

a confident person who has a strong sense of right and wrong, is adaptable and resilient, knows himself [sic], is discerning in judgment, thinks independently and critically, and communicates effectively;

a self-directed learner who questions, reflects, perseveres and takes responsibility for his [sic] own learning;

an active contributor who is able to work effectively in teams, is innovative, exercises initiative, takes calculated risks and strives for excellence;

a concerned citizen who is rooted to Singapore, has a strong sense of civic responsibility, is informed about Singapore and the world, and takes an active part in bettering the lives of others around him.

To encourage creativity and critical thinking, there is now less emphasis on assessment that tests rote learning. Questions posed to students are in the form of a situation or a problem and they are asked for solutions. Instead of just an exam that tests students on what they have learnt in the last year or the last three years, students are sometimes assessed on project work. The emphasis is no longer on how much they can recall of what they have learnt, but how well can they apply what they have learnt to the situations that are posed to them.

3 EDUCATION IN SINGAPORE IN 2020: THE EVOLUTION OF TEACHING AND LEARNING

Teaching and learning have evolved too. Teachers are exposed to new teaching methodologies and students do not just sit in the classroom and learn from textbooks. In the Sciences, students and teachers work together on experimentation in virtual labs; students sometimes participate via online learning with students from other schools or even other countries for collaborative learning. In the Humanities, students are encouraged to explore, discuss, debate and listen to their peers for different viewpoints and alternatives in dealing with an issue. Gone are the days when lessons would be conducted in a classroom with only a textbook as a learning tool.

The 21st-century lesson now comes in various formats and forms. Take Science for example. While teachers may conduct the lesson in a classroom or a virtual lab, students are increasingly the proactive ones proposing a hypothesis with the teacher acting as co-ordinator. Or students could be outdoors on learning trails (or if indoors, exploring these trails online), doing research on a topic and recording their observations, and collating the data into a report. These reports could be in audio, video or written form. **In the Science textbook of today, one will find augmented reality and web links that provide more information in the form of audio/video clips on a topic. There may well be animation and application software that come with the textbooks to be downloaded onto laptops or mobiles that students can use, such as tools for calculation or for manipulation in the form of a science experiment.** There will invariably be links that will open the door to the Internet for further information on the topics covered in the textbooks.

4 BEHIND THE SCENES: CHANGING TIMES FOR TEXTBOOK AUTHORS AND PUBLISHERS

Indeed, many of these changes on the local education scene would not have been possible without the active role played by the Ministry of Education. The Ministry set the tone by creating a better environment with its state-of-the-art schools that emphasise digital learning. **By including digital**

content as part of its curriculum development, it ensures that the new textbooks are engaging as well as educational. In fact, the MoE has been at the forefront of digital learning since the 80s. With its many grants and projects, it has enabled publishers to ride the learning curve of digital development. Although the processes for tendering and publishing of textbooks have not changed, the concept for a textbooks series will have to demonstrate that it has included all these necessary elements of a "smart" textbook before it is approved by MoE and used in schools.

It is an exciting time for textbook publishing as publishers now must cater to all these needs. It used to be that publishing a traditional printed textbook would require a team of authors, editors, illustrators and designers. **The publishers of the 21st century will have to do more. They will now have to be curators of engaging media content as well as producers of movie or video clips related to the subject matter.**

Authors especially face several challenges. They are no longer in the era of "See John run. See Jane run" or "A is for Apple". **The users of the 21st-century textbooks are digital natives and will not be engaged with just text on a page**. Their thirst for knowledge, their familiarity with online games, movies and documentaries, and their cognizance in sourcing additional information make them a very challenging audience. Therefore, authors not only have to ensure that their content is accurate, and facts have been thoroughly researched and are credible, they also must present these facts and information creatively. Many of the textbook authors we have are teachers who are currently in service. Many others work in a day job and write at night or in their spare time.

EDUCATION IN SINGAPORE
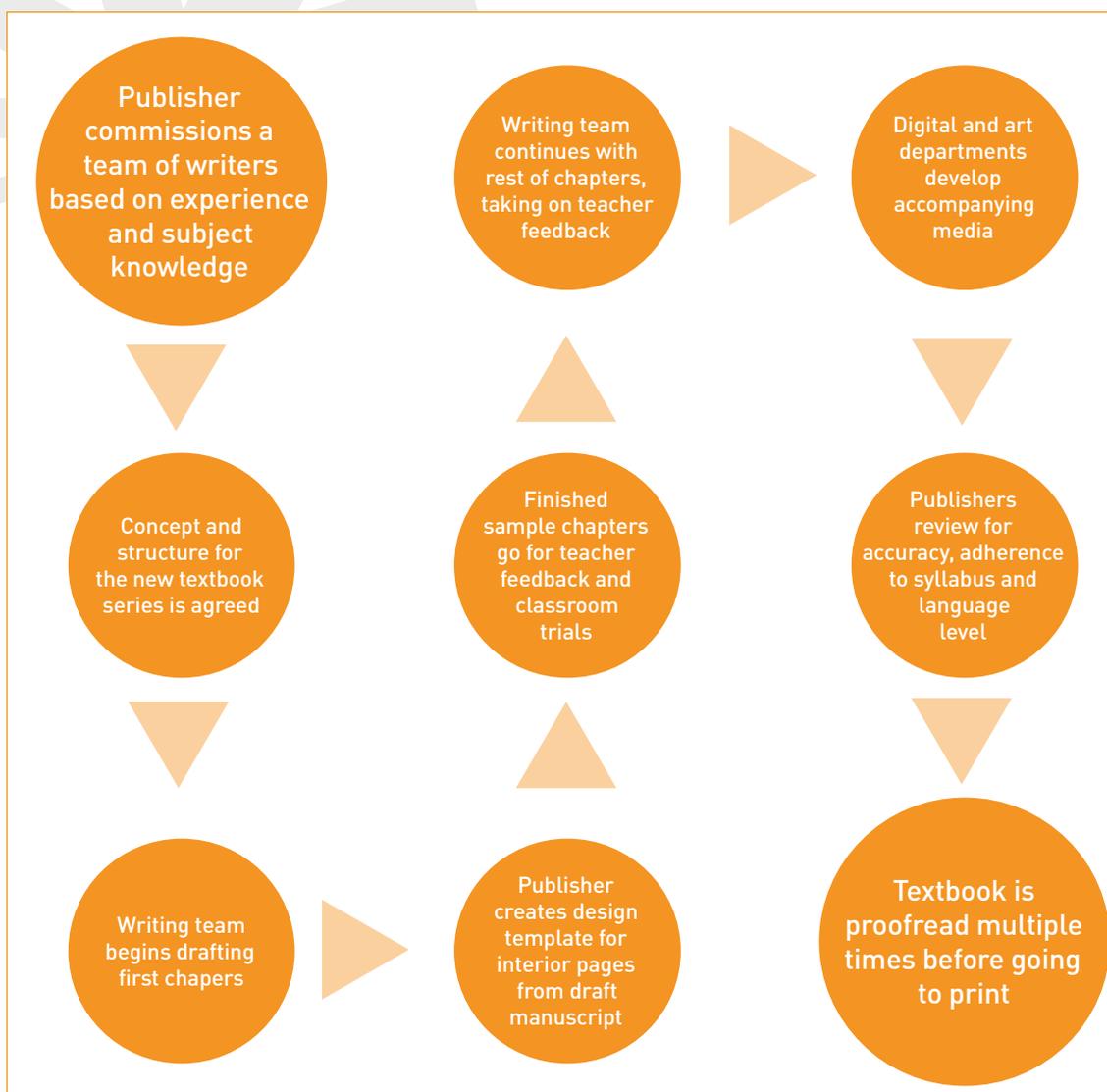
Let me share here the scenario in Singapore of what takes place before a new textbook is born. The publisher commissions writers based on their experience in teaching or their reputation as someone who writes well and understands the subject well. Not all good teachers are good writers and not all good writers can be good teachers. Hence the team must work together to cover each other's strengths and weaknesses. As textbooks come in a series based on the syllabus (for example, a Mathematics programme for K-5 would require a textbook for each level), the textbooks need to flow well from one level to the next. Some of the topics are cumulative; the skills or knowledge would have to be built up before the student can go on to the next level of learning. Writing a textbook is demanding because one cannot just produce a textbook independent of other learning materials. The conceptualisation of a textbook series demands much robust thinking and planning.

When the concept and structure for the new textbook series has been agreed on, the writers begin to put together a few chapters. The draft manuscript is then given to the publisher who creates a design template for the interior pages. The finished sample chapters, complete with any necessary illustrations or diagrams and captions, are then shown to teachers for their comments or trialled for use in some classrooms. The writers continue to write the rest of the chapters, taking into consideration the teachers' feedback as they go along.

Writing a book takes time (writing a series, even more time) . It may take six months to a year for a writer to complete a textbook for just one grade. Then there are the workbooks and the teacher's guide. The teacher's guide, which is generally written after the textbook is completed, is like a manual for the teacher using the programme; hence the author would need to anticipate the kind of classroom environment and the lesson that is being conducted in order to write a useful guide. It is most unrealistic to expect a complete set of textbooks and the accompanying materials to be published in the same year that a syllabus is launched. This is for a simple book. **Often it takes a team of 30 people, approximately 2 years to produce one textbook.**

THE PROCESS FOR WRITING A TEXTBOOK

It takes a team of

30

people

2

years

to produce

1

textbook

In the meantime, while the writing is being done, the digital and art departments start thinking about the types of media that would help the students gain better understanding of the topics at hand. Questions abound — How can each page be designed engagingly to capture the attention of the students? Should there be more infographics given that students these days do not like reading too much text? Should there be anime or games? Would that distract? Would apps help?

As the content is for use in schools, another important consideration is the relevance, authenticity and the credibility of the information. It is in this respect that publishers play another vital yet undervalued role. Publishers must check and verify the facts, make sure the content adheres to the syllabus, and that the language level is age appropriate. Before the book goes to print, it would have been proof-read multiple times to ensure the final product is of the highest standards required. There are some who think the textbook is irrelevant or unimportant in this age where information can be obtained easily from the Internet; the web has answers to everything, they would say. Yes, but is that information accurate? Factual? Biased? Has it been checked by specialists or experts? Is it even true?

There are, of course, very committed teachers who use materials of their own — either created by themselves or copied or borrowed from somewhere else — in lieu of textbooks and/or to supplement their teaching. Language teachers, for example, are fond of using real texts for teaching. While these teachers should be applauded for their effort and dedication, they must be mindful of the credibility of the information they use and, of course, the issues of plagiarism and copyright. The best teachers stress plagiarism is wrong, that it is essential to cite one's sources, and that one must always acknowledge copyright.

The publisher's role here will fluctuate between that of a licensor and a licensee. If the authors have used materials from other sources, the publisher needs to track these sources and negotiate the fees to pay them. On the other hand, the publisher also must negotiate the best deals possible for its team of authors when content licensing is involved. **The publishers recognise the need for flexibility when it is licensing its assets for distribution.** Customisation is likely to be required and the end product will likely change; as the product evolves through its many stages, more stakeholders may be involved and the processes may render the original rights holders unidentifiable, or not traceable, for example if both language and illustrations had been changed. In this case, the end-product may be a diluted version of the original and due recognition and compensation may not be paid to the original creators of the product, which is a risk that publishers must take. **The licensing can be varied as the end users in some countries have many variations – language, culture, social and religious taboos.**

There are many factors to be considered and the publisher has to negotiate the various curve balls thrown its way but it also has to ensure that in the end; its authors that it represents are getting their fair share of the income; that the partners are not constrained and are able to distribute as well as they can; that the content remains as its rightful assets and that there is no abuse of use. Of course, **for both publishers and authors, the goal is that the content sees the light of day and is used by as many as possible, with maximum impact on learners, especially in the field of education.**

5 CONCLUSION

What then should education in the 21st century be? How do publishers who are the curators and producers of new textbooks help to determine the values in education if their role as content creators is not appreciated or, worse still, trivialised as commercial entities out to exploit their readers? Are they empowered to contribute to the education scene?

To quote Bertrand Russell[2] in 1926 on the exciting possibilities of education:

> *I have tried to bring before the reader the wonderful possibilities which are now open to us. Think what it would mean: health, freedom, happiness, kindness, intelligence, all nearly universal. In one generation. if we chose, we could bring the millennium.*

Well, we have arrived at a new millennium and these aims for education still hold true almost a hundred years after they were first expressed. We want to nurture a generation of global citizens who can think independently, who have a sense of right and wrong and who can work together to create an even better world. As they say, it takes a village to raise a child and in this 21st-century village, I see publishers working with teachers, parents and all who are keen on education to raise our children together ■

---

2   Bertrand Russell, On Education: Especially in Early Childhood (Routledge, London and New York: 2003) p. 204

INTERNATIONAL PUBLISHERS ASSOCIATION
Promoting and protecting publishing worlwide