

Future Trends Report

Based on Analysis of the Team's Chosen Community / Organisation in Mid-Term and Final Evaluation

Community / Organisation Studied: Education Community

STEP 1. Identify Challenges

Read the Future Scene carefully and generate ideas for challenges, concerns, and possible related problems. Choose the 5 most important challenges and write them in the space provided. Include applicable research with appropriate in-text citations.

Challenge #1:

Two Professors we interviewed expressed that AI would not be able to empathise with students and sense the difficulties they are facing. They then specified and mentioned that AI would not be able to make cognitive or social connections with their students.

Hence should be unlike a human, AI is not able to sense what another person is feeling, nor is AI able to make personal connections with their students. This could lead to students often feeling that he cannot understand the AI's explanation since AI is unable to view the student's difficulty from his perspective and explain it well. It could also result in students not being as motivated to learn or lacking enjoyment in the process of learning.

Research on Challenge #1:

1. According to the Australian Association for Research in Education, "Teachers work hard to establish this mutual commitment to learning, as well as sustaining engagement through motivating, cajoling and enthusing individuals. All of these are interpersonal skills that come naturally to people rather than machines." ¹, showing that human teachers are more suited to connecting with students and motivating them to learn.
2. Another article published Youth Policy Labs, a think-tank specifically focusing on youth and hosted by the Berlin-based NGO, Demokratie and Dialog e.V, before attempting to

intellectually engage with a group, teachers will “take a mental pulse of the students’ demeanours”², evidence of human teachers’ unique interpersonal skills that AI lacks.

3. Another piece of evidence would be a book by David K. Cohen “Teaching and Its Predicaments”, as he says it, teachers are uniquely able to “put themselves into the learner’s mental shoes”³, showing that humans possess the ability to connect with other humans and view problems from their perspective, unlike AI.

Challenge #2:

Two-thirds of survey respondents said that they are worried about their/their child’s future employment prospects. Most of our interviewees also that more jobs would be lost in the future due to the 4th IR and the advent of AI taking over human jobs.

This could be especially problematic since in the future, a huge amount of work, even more than before, would be done by AI and automation. Students equipped with a more conventional skillset and lacking soft skills or social skills, such as creativity or empathy, may find that their employment prospects have decreased, due to AI already being able to perform their jobs.

Research on Challenge #2:

1. According to the Guardian, “Future graduates would need creativity and empathy - not just technical skills...In contrast, jobs in the creative industries – the sector probably most associated with the need for soft skills – in the UK rose nearly 20% to 1.9m in the five years to June 2016.”⁴, showing that creative jobs seem to be on the rise, as such supporting that future graduates would need more soft skills.
2. Another piece of evidence from Harvard University shows that, “workers who combine social and technical skills fare best in the modern economy, as measured by a 7.2 percentage point increase in available jobs and a 26 percent wage increase between 1980 and 2012” and “Those in technical jobs that have few requirements for social skills, such as specialists in STEM (science, technology, engineering, and math) fields, actually saw the number of jobs decline 3.3 percentage points. While wages for those jobs rose over the study period, the increase was roughly a quarter of that seen in jobs requiring both technical and social skills.” evidence of the need for students to have soft skills, in the future.

Challenge #3:

Three of our interviewees believe that other media is distracting students from their studies now, and believe that in the future as technology progresses, it will become increasingly addictive and distracting, especially since the development of AI will lead to increasingly higher levels of data processing for targeted advertising.

In the future, if students are distracted by technology and do not focus on their studies, they will find it extremely difficult to find jobs with the already shrinking supply of work with the invention of AI.

Research on Challenge #3:

1. According to Remedy Health Media, being distracted by technology causes “changes in one’s brain and addiction”, which can lead to students suffering from negative effects such as “procrastination”. [6]
2. In an article published by Child Mind Institute, it was revealed that habits derived from excessive technology use could harm children. Children who browsed social media/gamed excessively for example usually faced an “increase in anxiety and depression”. In addition, habits born from technology use such as multitasking, lead to “undermined cognitive functioning and decreased learning”. [7]

Challenge #4:

All of our interviewees recognise that in the future, it would be the soft skills that matter the most. Many survey respondents also responded by saying that the curriculum should be redesigned by teaching more soft skills.

This could be especially problematic in the future since these soft skills might be hard to grade and measure in an objective manner. Therefore, grading these soft skills may cause the effectiveness or the objectivity of such tests to be compromised. Hence, this might cause these tests to be inaccurate in measuring the progress of a student in picking up, learning and effectively using soft skills. This may, therefore, result in both students and teachers having an inaccurate gauge.

Research on Challenge #4:

1. According to the Organisation for Economic Cooperation and Development, “beyond an agreement on the broad objective, it is not clear how these (soft) skills can be visibly and tangibly articulated by teachers, students and policymakers, especially as part of the curriculum.”[8], establishing that there is a possibility that soft skills cannot be accurately tested in the future.
2. According to The Conversation, a not-for-profit media outlet that uses content sourced from academics and researchers, “Assessing capabilities is harder than assessing subjects – and the evidence base is much less well-formed.” [9], showing that it is indeed hard to assess soft skills.

Challenge #5:

Observation: All our interviewees agree that soft skills will be critical to staying competitive in the future. However, as the name suggests, soft skills are very difficult to teach and grade objectively for everybody.

Problem: Teachers will have a hard time designing a curriculum that is able to both fulfil the students need for soft skills and be objective at the same time. This may result in either effectiveness or objectivity being compromised.

Research on Challenge #5

Challenge #6:

A lot of our respondents have expressed their worries on issues of privacy regarding AI, and so have many other credible sources. A lot of organisations and professionals have expressed their worries on the ethical issues about the use of AI, like in the case of user privacy, data hacking and improper use etc. On issues pertinent to the education industry of the future is that the AI teachers will likely have very private, one-on-one sessions with their respective students in order to maximise the effectiveness in the exploitation of AI’s adaptability for the unique problems faced by each student. This will lead to very sensitive and personal data from the student being obtained and stored by the AI teacher.

Another problem is the threat of hacking into the databases to obtain highly sensitive information that can be potentially used for extortion or blackmailing. With AI requiring large amounts of data to run, it would be highly probable that the information gathered by all the individual AI teachers will be stored into one main database. This then will, in turn, give hackers an easy avenue into large amounts of sensitive and 'valuable' data the hackers are seeking.

Research on Challenge #6

1. According to Forbes Magazine, a hack on Facebook was 'an Internet catastrophe' that affected 'far higher than 500 million', even though 'a vast number of people have trusted Facebook would be able to keep their login information safe'. This could potentially happen to this future AI database and could cause equal or even worse damage.
2. According to CSO USA, in the past 20 years, countless big companies that carry important, private information from countless their clients have been hacked, causing public outraged over policies implemented. Given the frequency of these cyberattacks, it is plausible to assume there will be definitely a hack, or at least an attempt to hack, the future AI databases.

Underlying Problem:

Given that more jobs originally done by humans would now be allocated for AI to complete, students equipped with a more conventional skillset may find that they have become irrelevant, and face decreased employment prospects. How might we increase the adaptability of students so that they can be more employable in the future in the year 2030 and beyond in Singapore?

Solution 1:

We, the Ministry of Edu-Finance (MEF), would set up mandatory internship attachments at secondary school level with companies that are embracing new technology. These internships will take place during the June and December holidays, and the students would be expected to not just observe, but also do a limited amount of simple work in relation to the field in which the company is in. This will allow students to see how companies at the forefront of the industrial

revolution operate and teach them some of the skills necessary at these future-facing companies, allowing them to diversify their skillset and increase their adaptability.

Research for Solution 1:

1. According to the University of Iowa Pomerantz Career Center, internships allow you to “Learn new skills and add to your knowledge base”, which would be appropriate for students wishing to increase their adaptability.

Solution 2:

We, the Association of Secondary Schools (ASS), will reduce the weightage placed on exams and give all students more projects. These projects will have fewer restrictions on their topic than current projects, so as to allow students to pick topics they are passionate about and learn more. This emphasis on projects will increase student involvement, allow students to develop leadership skills, creativity and critical thinking, as well as allowing more self-directed learning by the students. All these would ultimately cumulate in students increasing their adaptability.

Research for Solution 2:

1. According to Channel News Asia, in the context of the mid-year exams being scrapped, “students rediscover the joy of learning”[13], evidencing students ability to learn their passions through self-directed learning.
2. According to the Ministry of Education, project work “Students will acquire the ability to make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task.”, “acquire collaborative skills through working in a team to achieve common goals.” and “learn on their own, reflect on their learning and take appropriate actions to improve it.”[14], these benefits of project work cumulates in students having increased adaptability.

Solution 3:

We, the Ministry of Advanced Technologies (MOAT), will incorporate AI teachers into an online platform (such as applications, websites etc.). This allows live updates on a student’s

progress to reach a parent at any time. In addition since AI teachers now have an ability to offer students their services, help etc. all the time, a student can now receive the help they may need at crucial times.

Research for Solution 3:

1. Existing platforms that could serve such a purpose after changed include streaming services such as Mixer, or teaching platforms such as Google Classroom or The Great Courses Plus. These websites/applications may be able to provide space for AI-Student interactions, replicating current Teacher-Student relationships on these sites.

Solution 4:

We, the Ministry of Education, will remodel the curriculum to encourage more self-directed learning. For the languages, students would be encouraged to debate literature via the Socratic Forum and other forms of open discussion, while for the sciences and math, students would be encouraged to rediscover existing concepts and then looking for patterns. This would allow the students to have a greater sense of self-discovery, and encourage students to learn on their own instead of cramming for an exam. The students would, therefore, become self-directed lifelong learners, allowing them to be more adaptable to future changes.

Research for Solution 4:

1. According to the Ministry of Education, “(self-directed learning) enables a person to be highly adaptive to new situations and environments, to gather resources and learn quickly so as to solve new problems or handle new jobs or situations they encounter”. [

Solution 5:

We, the Ministry of Education, will promote a system where students would be assigned project work groups with students from other classes. Project work relies heavily on communication between group members, in order for it to be a success. Hence, students would be required to frequently interact with other students that they might not have worked with before. As such, it will hone a student’s ability to adapt to different team members and work with them, to allow

them to develop interpersonal skills and learn from each other, thus diversifying their skillset and making them more adaptable.

Research for Solution 5:

1. According to the Ministry of Education Singapore, project work ‘is a learning experience which aims to provide students with the opportunity to synthesise knowledge from various areas of learning, and critically and creatively apply it to real-life situations. This process, which enhances students’ knowledge and enables them to acquire skills like collaboration, communication and independent learning, prepares them for lifelong learning and the challenges ahead.’
2. According to a research paper on the project work in Singapore using self-determination theory, ‘our students today face a knowledge-based economy, which requires the ability to learn independently, to be innovative in using and synthesizing knowledge, and to adapt fast to the changing world. Project Work (PW) is introduced as one of the instructional models for a more student-centred approach to learning in Singapore.’

OUR CRITERIA:

Criterion #1:

Which solution would be the fastest to implement for the organisation involved so that students would be able to increase their employment prospects the soonest?

Criterion #2:

Which solution would be the least expensive to implement so that the organisation involved would be able to increase the employability of students at optimum cost-effectiveness?

Criterion #3:

Which solution can help the most amount of students, so that the organisations involved are able to impact the most students?

Criterion #4:

Which solution would be the easiest for the students, parents of said students and educators to understand so as to reduce misconceptions and minimise unneeded panic?

Criterion #5:

Which solution would be most convenient for the students so that their schooling life would face the least disruption?

EVALUATION OF SOLUTIONS:

Step 3 Sol'n #	Solution Idea	Criteria					Total
		1	2	3	4	5	
#1	Industrial Attachments	2	1	4	1	1	9
#2	More freestyle project work	4	5	3	3	4	19
#3	Website/App	1	2	2	2	2	9
#4	Self-directed learning	3	3	5	4	5	20
#5	Inter-class project work	5	4	1	5	3	18

Action Plan derived from Solution #4:

We, the Ministry of Education, will implement a curriculum that promotes self-directed learning so as to encourage students to adopt an attitude of “lifelong learning” and encourage self-improvement.

This would be achieved by promoting a sense of discovery. Studies have shown that there is a direct correlation between how passionate a student is about a subject and the amount that said the student will absorb and retain about said subject.

By remodelling the curriculum such that students can come to a conclusion themselves, rather than telling them the conclusion and reverse-engineering problems, students would feel a greater sense of accomplishment and thus would retain the knowledge learned through the discovery

process for the answers. This method would inflame a passion for learning and encourage students to find out more.

If the students are used to learning through experimentation and discovery, the tendency for them to continuously seek self-improvement would increase their ability to adapt to a changing work environment.

Their ability to adapt would not only be appealing to employers but would also allow students to improve their skill set to match their employer's needs. Such adaptability would allow them to develop flexibility and other qualities that will be needed in the future, thus allowing them to stay competitive in an ever-changing workforce.

The present education system can be modified in ways that do not impact the core subjects that have been judged as necessary for the growth of the student.

For instance, subjects such as economics and history, students could use simulations to solve problems faced by people of the past. Teachers could show them how, using the processing power of AI to process a vast amount of data and creating accurate simulations, allowing students to not only ignite passion and promoting creativity. Not only that, with the realization that advance technology makes the job more productive and results better formulated, students will be able to appreciate the advantages of technology and thus will promote a sense of wanting to always learn more

For subjects like math and science, it can be done through experimentation and/or logical reasoning, where students would perform an experiment and work backwards in order to rediscover a principle or law. With the teacher acting as a guiding light, this would significantly increase the students' sense of accomplishment and the amount of learning a student does retain. Moreover, such an approach would allow the students to develop an attitude of "discovering things by themselves", and promote curiosity. This, in turn, builds a culture of continuous

learning.

For the languages, leveraging on AI's data processing abilities, the standard of each student in the class can be obtained. Appropriate reading material (newspaper articles about hot-button issues, extracts from books about issues relating to the student body etc.) can be recommended to teachers. Class discussion can also be promoted so as to build students' ability to express their opinions, as well as inflame curiosity about the issues or books, encouraging students to find out more about the topic, and thus breeding a habit of self-directed learning.

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Cite the resources you consulted using the APA format.

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