The Future of Education

Discussion brief **08**

Caloundra City Private School

Discussion brief Number 08

Personalised learning – the Core Four and EdTech

What do we mean by 'personalised learning?

Personalisation has too often been confused with other terms that indicate close relationships between teachers and students. While these relationships are vitally important, they do not necessarily mean that the student is receiving an educational service that is designed to meet their individual needs. We celebrate the fact that today's teachers make more of an effort to recognise students as individuals, as opposed to previous decades when students were expected to keep quiet, put their heads down, and follow instructions. Despite this, we contend that the education supply chain remains focused on the teacher and not on each student. This legacy practice continues because schools have maintained their allegiance to a model of schooling that predates 4IR. These practices were designed to process batches of students through the education system, partly because of the huge numbers of students in the system once free public educating was introduced, and partly because we had no other way of delivery. Teachers were trained to be fountains of knowledge, but they were also the gatekeepers of knowledge. They were the ones who selected what was to be taught (while complying with the relevant syllabus), when it was taught, and how it was taught. The principal and the leadership team at each school then allocated resources to teachers, usually through departmental budgets. Whatever the process of allocation, most educational resources funnelled through the teacher who positioned themselves in a classroom so they could be heard, seen, and see in order to supervise. As we noted in the discussion brief on proficiency, it was assumed that if students were present, quiet, took notes and did enough to pass their assessments, they were ready to proceed with the rest of the class group to the next year level. This approach was not and is not, despite refinements, personalisation.

In 2016, Johns and Wolking from Education Elements produced a paper identifying four core components of personalised learning. These were Flexible Learning Content and Tools, Data Driven Decisions, Targeted Instruction, and Student Reflection and Ownership. Education Elements issued an updated version of the Core Four in 2021.[ii] The revised version was informed by many schools' experiences prior to and during the COVID-19 pandemic. Its four elements were Flexible Path and Pace (probably more realistic given curriculum constraints), Targeted Instruction, Collaboration and Creativity, and Reflection and Goal Setting. This version also formally recognised that students must be supported by a nurturing learning environment, something no dedicated educator would dispute.

We have blended the two versions, assuming a focus on the ten transferable skills, as follows:

1. **Flexible Learning Experiences, Pace and Tools**

2. **Data Driven Decisions** (which is incorporated into Targeted Instruction in the 2021 version, but we believe there is a need to emphasise the importance of data);

3. **Targeted Instruction (appeared in both lists)**

4. **Student Reflection and Ownership** (which always incorporated Goal Setting, as explained below).

We agree that Collaboration and Creativity are important, but they already have a place in transferable skills which were introduced in Discussion brief 3. We have added a fifth component, A Team of Specialist Educators, because we cannot see how a high-quality personalised program could be delivered without a team of specialist educators meeting the needs of individual students. It is the team that brings specialist skills into each student's learning network, while also embellishing the nurturing learning environment, as will be explained in Discussion brief 10.

Flexible Learning Experiences, Pace and Tools

Learning experiences (not just the subjects taught), the pace at which students progress through these experiences, and the tools employed in their delivery, should be appropriate for each individual student. Gonski, D. et al 2018. were concerned that the relatively new Australian curriculum (which applies up to Year 10) did not allow teachers to cater for different learning needs[(iii)] and did not have General Capabilities (transferable skills) at its core.[(iv)] Year 11 and 12 students complete state-based curriculums that are often more theoretical than applied[(v)], crowd-out broader educational outcomes[(vi)], treat vocational education as less prestigious than an academic pathway[(vii)](, encourages teachers to work in subject silos rather than adopting an interdisciplinary approach[(viii)] , and encourages schools to 'focus too much on identifying candidates for higher education and lose sight of the skills required by employers'.[(ix)] There are alternatives, but unfortunately:

Despite many attempts, over several decades, by the Commonwealth and states and territories to address the issues around the curriculum and delivery structure for Years 11 and 12, the situation remains unsatisfactory. There has been very limited change in curriculum purpose and content, or in the models for providing senior secondary education, despite considerable growth in the student cohort; the large numbers of young people who start secondary school but do not make it into senior secondary; profound changes in the world of work students are being prepared to enter; and growing levels of youth unemployment and underemployment. There is a compelling case for ministers in all states, territories and the Commonwealth to mount an urgent national review.[(x)]

History tells us that genuinely comprehensive reviews are unlikely to occur and even less likely to result in significant change. We formed this opinion because the newest version of the Australian Curriculum will be known as Version 9.0.[(xi)] This does not indicate there have been 9 revisions because there were also minor revisions such as Version 8.4, the version that preceded Version 9. It appears that 'to review' means to tinker around the edges and subject it to the latest political and ideological influence, a common approach when reviewers have no clear understanding of why such a review is necessary. No wonder teachers are cynical about change!

1 Schools often use the terms 'cocurricular' or 'extra-curricular' to describe learning experiences not connected to a formal syllabus.

There are alternative curriculums, but only a few are recognised by state authorities. Finland, Switzerland, and New Zealand all offer programs that overcome some of the shortcomings of Australian curriculums and assessment systems, but they are not endorsed by Australian states. Each state offers its own curriculum for Years 11 and 12 that lead to a certificate issued by that state and/or an ATAR score that, for some reason beyond our comprehension, is calculated differently in each state. All this means there are limits on the degree to which students can choose their own path with respect to the formal curriculum.

Most curriculums offered in Australia do not adequately promote vocational pathways (according to Gonski et al. 2018 and Shergold et al. 2020), which are too often and unjustly seen as inferior to the 'academic' path. Pearson's 2020 Global Learner Survey produced data indicating the relative value respondents placed on trade training versus university qualifications, as illustrated in Figure 1.

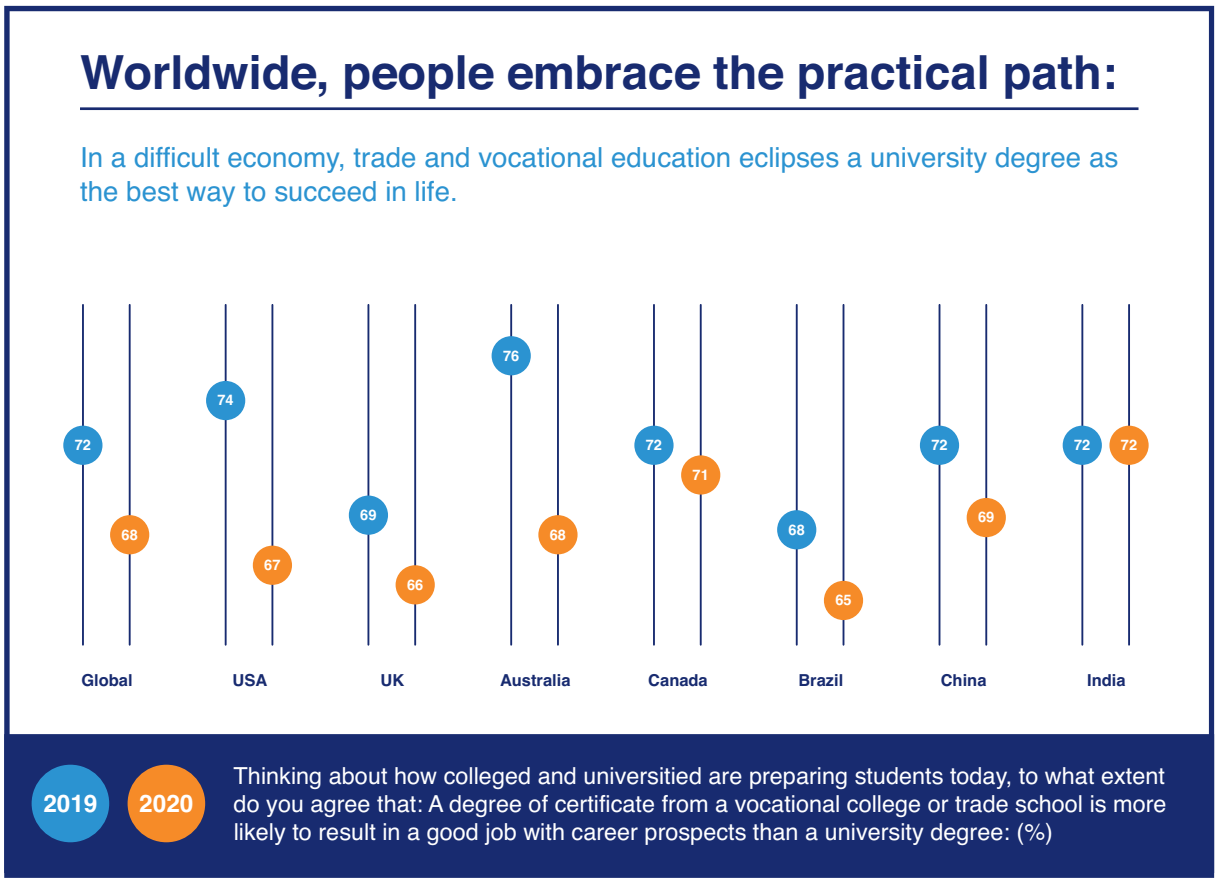

Figure 1: Pearson's Global Learner Survey. Perceptions of the relative benefits of vocational or trade school vs. a university degree.[xii]

We were surprised by the size of the gap in the levels of support for the two forms of post-school education and the fact that the gap was widest in Australia, closely followed by the USA. In 2020 76% of Australian respondents (up from 68% the year before) believed that a trade or vocational school was more likely to result in good job and career prospects than a university degree. This has implications for flexible pathways, but also calls into question the emphasis schools place on ATAR results, curriculum design, and the future viability of some universities. (We are not suggesting students don't need a credible ATAR score, but it needs to be kept in perspective.) In the meantime, we need to adopt an approach that values and facilitates a range of learning opportunities.

A recent article in MIT Sloan Management Review by Michael Horn and Karen Dillon provided examples of the growth on non-university learning options in the USA. Amazon, for example, intends to invest $700m USD to train 100,000 workers, around 30% of its workforce, because 'Amazon's leaders believe that traditional higher education can't provide the education their employees require, and the company needs to take ownership of the educational component of its value chain.'[xiii] This was forecast in The Future of Education: Epic 2020, produced in 2012. It painted a picture of the future of education. While it is true that 2020 has come and gone, and education has not yet transformed, many of the predictions can still be described as prescient, and universities would be wise to consider them[2]. Perhaps we need to stop thinking that students leave school to vocational training and work OR university. We suspect we will see more students mixing vocational qualifications, university degree, badges and other micro credentials gained on-line. Our prediction was endorsed in the Shergold report when it proposed the introduction of an education passport:[xiv]

Young people will be prepared to move between higher education and vocational training providers. They will understand the value of work-based learning. All these learning experiences will be progressively added to their Education Passport.

Schools could offer micro-credentials to students, accredited by outside bodies such as employer groups or universities, which would enrich their resumes in time for graduation, an initiative also supported in the Shergold Report:

The Senior Secondary Certificate of Education, ATAR or senior secondary end-of-year assessments need to have sufficient flexibility to credit microcredentials and other learning options. [xv]

We hope one day to see greater flexibility with respect to the formal curriculum. In the meantime, we will look for other adjacent learning opportunities. In other words, we need to comply with curriculum requirements (those that lead to a Queensland certificate of Education and an ATAR score) but also facilitate other learning experiences that do not normally appear on a school's timetable. We should think inside and outside the curriculum box.

Control over the pace of learning is possible, particularly up to and including Year 10. Achieving this at Years 11 and 12 is more challenging but achievable[3], particularly if leaders of universities, schools, and businesses design a program to replace the ATAR system with a more effective way to determine who receives tertiary offers. It was interesting to note the large increase in early offers made by universities at the end of 2021. This was likely a consequence of increased competition for domestic students given the loss of international students due to COVID 19, but if these students are successful, it may encourage universities to look beyond ATAR scores and allow for the path and the pace of course completion to vary more than it does at present. (We will explain the Carnegie Unit and its ludicrous impact on the pace of learning in a subsequent Discussion brief.)

Summative assessment requirements are the biggest constraint on pace. Teachers are required to submit samples of work for verification and students sit externally developed exams on predetermined dates. However, there is nothing stopping a student finishing the course sooner, completing their school based summative assessment earlier, and presenting themselves for the exam (that have set dates) as and when required. This would require subject teachers to develop a range of tasks and the student would want to revisit revise subject material before the exam date. The intervening time could be used to engage in other learning activities.

2 Epic 2020 can still be viewed at https://www.youtube.com/watch?v=5gU3FjxY2uQ.

3 Assessment tasks in Queensland must be approved before they are completed by students. This discourages teachers from changing tasks from one year to the next or from offering students a choice between tasks.

Students who progress at a slower pace than anticipated (they require more than the 'indicative hours' to complete the course) present a different challenge. These students would need to prioritise the subjects most in need of attention well before key assessment dates. The education team (explained in Discussion brief 10) would allocate more resources to help them. Some other learning activities would be suspended at this point. One of the reasons we suggest students take five instead of six senior subjects is to give them time to use for other learning activities throughout the term and, if necessarily, to prioritise the subjects they find most difficult. We expect few if any students to be in this position if the team operationalises data 'just in time', instruction is targeted, and they have access to a greater range of learning tools.

As we have seen, the final piece of the first Core Four, flexibility in tools, is well within our grasp if we apply what we know about the learning process.

An exclusively 'talk and chalk' approach, supplemented by written texts and delivered at the same time and the same pace is appropriate for educating large, homogeneous groups. The problem is there is no such thing (there never was) as a large, homogeneous group of people. As noted earlier, the mode of communication and pace of delivery must be tailored to how each individual student learns when appropriately challenged. There must be opportunities for students to stop, rewind and revisit concepts instead of pretending they are keeping pace with the teacher and what they believe is the rest of the class. (Teachers certainly need to talk less than the 80% or more of total lesson time observed by the highly respected educational researcher, John Hattie.)[(xvi)] Cost is not the main issue here; it's the time required to analyse student data and select great material for every individual. Remember that learning should be fixed, and time (pace) should be variable, not the other way around. Today's educators could consult with students to select from a growing array of learning tools. This does not occur often enough because teachers (and students) are too busy setting, sitting, and marking assessment tasks so they can move to the next topic– the tail is wagging the dog!

Targeted instruction

The 'one size fits all' approach is no longer acceptable. Each student should have their own learning path developed in consultation with their education support team (the Plus One to be added to the Core Four). Every learning activity (teacher led, online learning module, project, station rotation activities, homework etc.) must have a specified purpose and form part of the student's learning journey. Educators must ensure that students, whether they be working in a class group, small group or individually, are able to answer the following seven questions confidently and accurately:

- What are you doing? (The answer should be specific.)
- Why? (The answer should be specific – "Because it will help develop my ability to…" NOT – "Because the teacher told me to.")
- How well are you doing it? (The response should be honest and underpinned by an acceptance that it is OK to struggle and the knowledge that help is available.)
- How do you know how well you are doing? (The answer should refer to recent performance data – formative assessment that belongs to the student.)
- What would you do if you got stuck? ("Ask the teacher for help" shows some level of self-regulation, but "Access my learning network" is a better answer. "Wait for the Great Butterfly of Knowledge to land on my head" or "Hope it isn't in the test" are not acceptable answers.)
- Would you find it easy or hard to do this? If hard, how could we make it easier? (The response should indicate a high level of trust in the support team.)

- What is your next challenge (in this subject or project)? (Once again, the answer should be specific, and the student should be able to explain how current tasks are linked to future tasks and how they represent steps in their personal learning journey.)

Intentional teaching is endorsed by many curriculum and pedagogy designers, including the QCAA.[xvii] We are not advocating one approach but support any blended learning approach that results in quality learning targeted and tailored to each individual student's needs. We are concerned that an overemphasis on pedagogy could fall into the trap of focusing on inputs (teaching techniques, resources etc.) instead of outputs (growth in student learning) so we support calls to replace it with the term 'andragogy' (collaborative design of approaches to learning). Teachers/coaches etc. should be encouraged to be creative provided they can demonstrate a positive impact on student learning[4].

We see proficiency-based progression as an important part of targeted instruction. We use the term 'proficiency' to describe the degree to which a student has understood and can employ the knowledge and skills they have been trying to learn. (We used the term 'trying' because we cannot assume they have 'learnt' until proficiency has been demonstrated.) The term 'Competency' is sometimes used to describe an 'adequate' level of knowledge and skill development, while 'Mastery' implies a relatively high level of expertise. 'Competency' and 'Mastery' sit on the proficiency spectrum.

Unit designers should identify relevant proficiencies, place them in sequence, explain how they are linked, and give examples of what varying degrees of proficiency look like. The Khan Academy (https://www.khanacademy.org/) does an excellent job of this.

The 2018 Gonski review recognised the role EdTech can play in helping educators target instruction:

…teachers must be given practical support by creating an online, formative assessment tool to help diagnose a student's current level of knowledge, skill and understanding, to identify the next steps in learning to achieve the next stage in growth, and to track student progress over time against a typical development trajectory.[xviii]

Distilling a list of proficiencies for every subject is necessary for targeted instruction to occur, but many educators would be challenged by the task, mainly because they did not design their subject's syllabus. Reference to the list of transferable skills would help the process and result in a more useful conclusion. In other words, each proficiency should relate to one or more of the transferable skills, which includes literacy and numeracy as the building blocks of learning. Notwithstanding these concerns, each individual student's learning plan should employ an array of learning tools, be specifically targeted at the relevant proficiencies and designed to assist the individual learner.

Data driven decisions

Data in this context refers to quantitative or qualitative evidence of learning, not time spent being taught. Truth is that schools place too much emphasis on inputs (seat time) and too little on outputs (demonstrated learning). Evidence can include teachers' observations, although these carry more weight if similar data are coming from several experienced and independent teachers over time. It can be diagnostic (assesses generic learning skills) or subject specific. All data should be reliable (consistent across time and circumstances) and valid (have an acceptable degree of certainty). Diagnostic data, which are usually obtained from norm referenced tests (such as those developed by the Australian Council

4 Pedagogy (teaching methodology) describes something done to the learner, while andragogy refers to learning co-designed with the educator, and heutagogy refers to learning designed by the learner. We should abandon the term pedagogy in favour of andragogy in order to equip students to practice heutagogy when they become adult learners. This is the main reason we included Learning and Social networks that Extend Beyond the Campus in the ten transferable skills.

for Educational Research – ACER) tends to be more valid and reliable. The aim should be to use diagnostic data to inform the andragogy (replacing the term pedagogy) employed while data from subject based assessment instruments should be used to review and revise the learning process. We should not swamp students with these tests and make use of these data when we have them.[5]

The 2018 Gonski report highlighted the benefits of personalisation for all students and correctly identified the role of high-quality data (our emphasis in bold).

Personalised learning and teaching—based on each child's learning needs, and informed by iterative evaluation of the impact of those strategies— are effective at improving education outcomes for all students. This holds regardless of a student's circumstances, whether they are students with disability, students in rural or remote locations, Aboriginal and Torres Strait Islander students, those from non-English speaking backgrounds, low socio-economic backgrounds, gifted and talented students, or any combination of these.[xix]

(Pearson has created a program to diagnose a student's mathematical thinking which enables the student and their team to identify where help is most needed. Maths Pathways is another program that offers a personalised learning experience for students.[6] We have not included these to endorse them, but to provide examples of what is available.)

Regardless of the methods used, every member of the education team, including the individual student, should ask the following questions as they review performance and wellbeing data:

1. What? (What are these data? Are they valid and reliable?)

2. So What? (What are these valid and reliable data telling us about the learner?)

3. Now What? (What actions should be taken to build on strengths and address weaknesses?)

4. Why Not? (Why not take a different approach if the usual actions are not effective?)

A pleasing set of data would show each student's growth over time. How well a student is developing (not how fast) is far more significant than an 'A' to 'E' grade. Of course, this would mean that every student's report would indicate where they are in their learning journey, which will not be the same as the learning journey of their neighbour. Many Australian states require reports to grade students from 'A' to 'E', so we may need to report both for the sake of compliance while ensuring that everyone understands which data carries the greatest weight. Of course, not all data relates to academic matters – data about a student's well-being and the school's culture (through occasional student surveys, Focus Groups, and interviews) are also very important.

Clayton Christensen reminded people to be wary of data because they are developed by humans, which means they are to some degree subjective, and they are 'backward-looking' (they tell us what has already happened rather than what is going to happen).[xx] We are promoting their use because they are an improvement on making plans for learning based on impressions or on data that are vague or blunt. A range of data that is cross-checked against other data and, most importantly, endorsed by the student concerned, will at least indicate areas for further exploration. Of course, the time it takes to collect a lot of data needs to be weighed against the need to assist the student 'just-in-time'. While many contemporary EdTech programs have data gathering and reporting capabilities, the team still needs time to consider data and formulate responses. Ideally, students and their team (which, as you will see, includes parents) should have access to a continuous flow of easy to comprehend, up to the minute data. This requires us to carefully identify the data we need and shed the assessment tasks that are of least use.

5 I suspect NAPLAN and other test results are not fully utilised by classroom teachers, although I am sure primary school teachers use them more that secondary teachers who probably don't understand what they are.

6 The program developed by Pearson is designed for Australia and can be viewed at https://www.pearson.com/en-au/educator/diagnostic/ and Maths Pathways can be viewed here: https://mathspathway.com/the-hidden-culprit-of-our-declining-maths-results/

We suspect that many senior students and their teachers are too distracted by summative assessment tasks that are often vague and at best tell students what they should have done if they could 'wind back the clock' and do the task again. [7] Data from formative assessment tasks (provide guidance rather than a grade) are more valuable.

Data Driven Decisions was incorporated in Targeted Instruction in the 2021 version of the Core Four because 'we know that these two elements go hand-in-hand to help teachers and students design learning experiences tailored for individuals and groups of students'.[xxi] We agree they are strongly related, but fear removing it from the list of four may cause it to be overlooked. Many teachers would argue that their instruction is targeted at individual students, but unless their decisions are based on excellent personalised data, their claim may be based on little more than a gut feeling. Keep in mind that the choice and use of data will tap into the expertise of the various members of the team, each with their own specialisation, not just the perspective of the classroom teacher. This will be explained in more detail in Discussion brief 10.

'Student reflection and ownership' (student agency)

As students mature, they should come to see themselves as the captains of their education team. As such, they should be fully aware of what they commit to when they enrol in a school and in a course of study. They should also take ownership of data relating to their academic performance and behaviour. Of course, they should also have the right to question the validity and reliability of assessment instruments and the data attributed to them. Unless there are genuine grounds for disputing data, students should use them to reflect (with guidance if required) on their performance and how they can improve (they should 'fail forward'). Students or parents blaming the teacher or anyone else undermines personal growth and leaves students with poorly developed self-mastery, the most important of the ten transferable skills. Students generally know when they have performed below their capabilities, but they may be tempted to make excuses. Every time a parent accepts these excuses, they undermine their child's self-efficacy (because they suspect their parent doesn't think them capable of better), their resilience (because they are not expected to bounce back) and their determination/work ethic (because their parent may be telling them that it is OK not to try). It would be much better to ask them to reflect on their own performance and decide for themselves whether or not they have succeeded. This will help prepare them for their role as captain of their team, to be explained shortly.

The OECD's Learning Framework 2030 emphasised the importance of student agency:

Future-ready students need to exercise agency, in their own education and throughout life. Agency implies a sense of responsibility to participate in the world and, in so doing, to influence people, events and circumstances for the better. Agency requires the ability to frame a guiding purpose and identify actions to achieve a goal.[xxii]

The latest version of The Core Four placed the greatest emphasis on this element when it stated that 'Building each student's ownership of their learning is the goal of personalising learning.'[xxiii] It went on to identify four key principles that form the basis of student ownership [the student's]

self-awareness of their unique strengths, interests and learning modalities, empowering them to advocate for themselves and their communities, [their] self-management skills that encourage personal and academic growth, and [inspiring] them to become lifelong learners.

7 The number of summative tasks was reduced in Queensland a few years ago, but the various tasks set by their (most often) six subject teachers leads to a bottleneck during assessment season.

The authors correctly emphasised the importance of a supportive learning environment that promotes self-awareness, social awareness, and strong relationships.

We were disappointed that 'Reflection and Ownership' was replaced by 'Reflection and Goal Setting' in the latter version of the Core Four. While we applaud the focus on student's willingness and ability to set goals (which gives purpose to self-regulation), we are reluctant to take the spotlight off 'Ownership'. CCPS should aim to graduate students who accept responsibility for their learning and are well equipped to achieve the goals they set for themselves.

The role of EdTech

High quality EdTech are powerful learning tools. The best of them can present knowledge and skills in an engaging manner. They allow the learner to pause, revisit, and investigate related concepts and events. They can also gather data about the learner's proficiency and, in the case of adaptive programs, target the next instructional step accordingly. It becomes a powerful tool for learning rather than a tool for teaching. Correctly employed, they allow the teacher to focus on contextualising, extending, and providing 'just in time' assistance to individuals and small groups of students who are 'stuck' in the same place. Poor EdTech (of which there is plenty) does none of this. High quality EdTech complements the work of human educators whose job is to be human. It does not replace them.

A final word about data

We acknowledge the concerns expressed by Christensen and Sir Ken Robinson about an overemphasis on standardised testing. We are not supporters of frequent high stakes testing. We do support regular formative assessment and the occasional use of norm referenced tests as diagnostic instruments. Such 'tests' (they can be simples quizzes) can indicate levels of proficiency and the need for further assistance. This process is useless unless it triggers immediate action to address problems. It lets us know that a student stopped to tie their shoelaces and is temporarily lost. That's good to know, if a member of the team goes back to help them find the right track.

Extension Activity

We placed the link to Epic 2020 in a footnote. We still find it thought provoking, even though it was produced many years ago and we are two years past 2020.

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(xvii) The QCAA guide to intentional teaching in early years can be found by following this link: https://www.qcaa.qld.edu.au/kindergarten/qklg/practice/intentional-teaching-practices

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