



All Hands on Deck

*The Flipped Classroom, ClickView and
Lifting Australia's Educational Performance*

Executive Summary

This report focuses on the educational potential of the flipped classroom. It explores how the practice may offer a meaningful application of educational technology in the classroom and, in turn, how it could assist more broadly in lifting Australia's educational performance.

Authoritative research has demonstrated that in terms of reading, scientific and mathematical literacy Australia's performance has declined between 2000 and 2012. These declines bring in train negative consequences for Australian students economically and socially. It is the role of multiple stakeholders, from policy-makers to researchers to schools, to address this situation.

The educational technology sector is one of these stakeholders and the sector must rise to the responsibility of supporting educators in pursuit of lifting Australia's educational performance. Educational technology must ensure it is assisting educators in a meaningful way as a matter of first priority.

The flipped classroom practice is one application of educational technology that holds promising potential to assist educators deepen their impact and help students progress. This report focuses on three of these applications:

1. Connecting direct instruction and constructivist learning methods to help facilitate surface to deep learning.

- Direct instruction delivery occurs outside of the classroom and constructivist pedagogies like problem based learning to occur during class time.
- This enables effective surface to deep learning through problem based learning, inquiry based learning and other related constructivist methods.

2. Assisting with differentiation and targeted teaching.

- Because students undertake a portion of the learning prior to the lesson, the teacher can check for understanding before commencing the lesson.
- If there are gaps in understanding or areas of difficulty these can be identified more accurately and addressed more efficiently.

3. Aiding in the delivery of effective feedback.

- Flipped lessons provide educators with formative information about what students understand and what they might be struggling with.
- This enables the provision of task-oriented feedback in class that helps students to bridge the gap between where they are and where they need to be.

The report also examines the way in which ClickView is working to support teachers in further realising the educative potential of flipping the classroom through ongoing software development designed to deepen the educational impact of using video in the classroom.

Ultimately, the task of alleviating Australia's educational troubles is the task of many stakeholders. ClickView believes in the responsibility of the educational technology sector to recognise this and operate accordingly. In turn, ClickView is working hard to effectively support teachers in deepening their impact, helping their students to progress and continue doing their crucial work in helping lift Australia's educational fortunes.

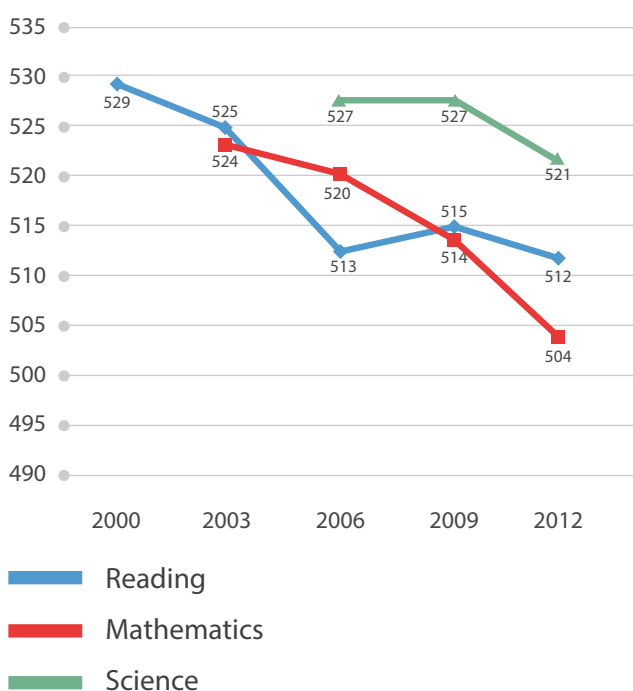
The Flipped Classroom, ClickView and Lifting Australia's Educational Performance

The flipped classroom is one application of educational technology that holds promising potential to assist educators in a meaningful way. The practice enables effective connection of direct instruction and constructivist learning methods, it can assist teachers to differentiate more effectively and can aid in the delivery of effective feedback. Indeed, the flipped classroom is a good example of an application of technology in education that appears to be having a positive impact supporting teachers in helping their students' progress. ClickView believes the flipped classroom is a genuinely positive innovation in education and stands ready to play its part in fostering this practice, supporting teachers and lifting Australia's educational performance.

Introduction

When it comes to education, Australia is facing a troubling situation. The Australian Council for Educational Research (ACER), drawing on OECD data, has found that student performance across a range of disciplines has been declining consistently since 2000 (ACER, 2016). As reading, mathematical and scientific literacies continue to drop we are faced with a growing number of young people lacking requisite skills to participate in the contemporary workforce. According to ACER, 14% of all Australian 15 years olds lack the necessary reading skills and 57 000, or 20%, of all 15 year olds lack the necessary mathematical skills to participate in the emerging labour force (ibid.).

Chart 1: Mean Scores for 15 Year-Old Students, Australia, PISA 2000-2012



Furthermore, the Grattan Institute – Australia's premiere policy think-tank – has found that the spread of achievement in Australian classrooms widens considerably between Years 3 and 9.

In Year 3 the middle 60% of students are working within a two-and-a-half year range, by Year 9, the middle 60 percent of students are working within a five-and-a half year range (Grattan, 2016). This is known as the long-tail of student achievement. The long-tail of achievement makes the work of teachers to accurately tailor and target their teaching incredibly difficult.

Beyond labour market ramifications the decline charted by the OECD is worrying for its implications for other aspects of human development. It is important to remember that education is not simply about equipping citizens to get jobs but helping people to flourish by equipping them to think, imagine and reason, to reflect-critically on their own lives and form conceptions of right and wrong. To be, as the philosopher Martha Nussbaum calls it, "truly human".

But many of these capabilities are the products of an education that involves the achievement, among other things, of reading, writing, mathematic and scientific literacy (Nussbaum, 2011). So declines such as those charted by the OECD, ACER and Grattan are important for the consequences they may have for young-people's ability to flourish.

From policy-makers to practitioners to parents, all stakeholders in the education sector have a role to play in arresting and reversing this trajectory and ensuring all students are equipped with the capabilities to thrive and flourish both at school and beyond.

Geoff Masters AO, CEO of ACER, has highlighted five crucial things that need to be done in order to lift Australia's educational trajectory.

1. Increase reading, mathematical and scientific literacy levels;
2. Ensure every student has access to excellent teaching;
3. Reduce the long tail of students who fall behind;
4. Raise the professional standard of teaching;
5. Increase school readiness of all children

The broadness of these goals reinforces the broad response required; the responsibility for improving our educational narrative does not lie with one stakeholder alone. There is a stubborn tendency to suggest that teachers are the sole solution to educational problems in this country. This is incorrect.

Ultimately, lifting Australia's educational performance is a multidimensional task requiring cross-sector efforts from teachers, principals, parents, students, researchers and policy makers. This holds true for educational technology. It too has a role to play, even if it is a small role, and the sector must play that role responsibly.

The purpose of this paper is to highlight and explore the potential of one application of educational technology - the flipped classroom - and to consider how it is placed to support teacher practice and, in turn, contribute to helping lift Australia's educational performance.

The next section of the report examines educational technology more broadly before turning to the specific application of the flipped classroom.

Education Technology: The Cambrian Explosion

Education technology is currently a booming industry. In 2015 the Software & Informational Industry Association estimated that in the US alone the market for K-12 Educational Software and Digital Content was worth US\$8.38bn (SIIA, 2015). This industry spans everything from content software (such as interactive language learning), to learning managements systems, to massively open online courses. Indeed, this momentous proliferation of educational technology sits within the broader technology boom we are currently experiencing.

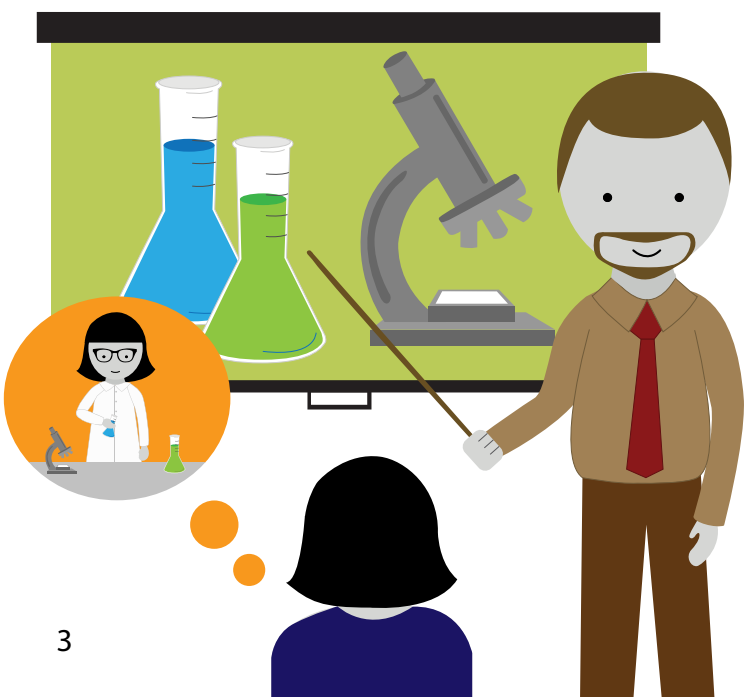
But is educational technology actually "good" for education?

“Ultimately, lifting Australia's educational performance is a multidimensional task requiring cross-sector interventions and efforts from teachers, principals, parents, students, researchers and policy makers.”

On one hand, there are those who offer a resounding: "yes." These voices hail education technology as a transformative force offering much needed renewal for an atrophied education system trapped in the 19th Century. For example, The Economist has suggested that educational technology could reverse falling rankings and give countries worldwide the chance to race ahead (The Economist, 2013). Professor Jeff Jarvis, one of the most outspoken proponents of the potentials of technology, has also suggested that education is an institution that stands to benefit greatly from "disruption" – whereby orthodox ways of doing things are suddenly altered by the entry of a new variable (like new technology) (Jarvis, 2009: 210).

On the other side, are those who question whether technology is of inherent value in education. This camp does not reject technology wholesale, but draws a number of question marks over its role in education. A 2015 report from the OECD noted that where ICT is used in the classroom, "their impact on student performance is mixed, at best." (OECD, 2015). Furthermore, Professor John Hattie has also raised questions about technology calling it a distraction that in reality is simply used for knowledge consumption rather than anything transformative (Hattie, 2015).

However, diving deeper into the research we find that these critical perspectives on technology



do not write it off completely. They simply seek to qualify the grand rhetoric with sober analysis and encourage thinking more critically and analytically about where and how educational technology can have a meaningful impact. It is in this type of analysis that we will find the most valuable ways that technology can make a positive difference. John Hattie has written of the need to see, “technology as an aid to teaching for enhanced knowledge production,” (Hattie, 2015) and the OECD has noted that technology can amplify great teaching if used properly (OECD 2015). What holds here is that technology in education works best when it serves to deepen the impact of educators and their practice.

Does the technology allow educators to better know their students? How they learn? Where they are at? Does it enable differentiation? More effective feedback? Does it allow for targeted teaching that can meet students at their points of need? Does it open up opportunities for higher order learning? For collaboration? For problem-solving? For critical and creative thinking?

Education is a crowded space, educators work tirelessly to navigate this space in the pursuit of progress for their students. Indeed, they are situated at the coalface of Australia’s broader educational narrative, they work endlessly in myriad ways to lift Australia’s educational fortunes.

Education technology owes it to teachers to support them in this effort. There is a multitude of useful technology that can offer meaningful ways to enhance knowledge production but there is also a multitude of useless technology that adds no value or, worse, detracts. It is the responsibility of educational technology to be the latter not the former.

“It is important to remember that education is not simply about equipping citizens to get jobs but helping people to flourish by helping them to think, imagine and reason, to reflect-critically on their own lives and form conceptions of right and wrong.”

One innovation in educational technology that does offer the potential to aid teaching for enhanced knowledge production, to help deepen impact and to amplify great teaching is the flipped classroom. This report will now turn to examine this application of technology in greater depth.

One path forward: The Flipped Classroom

The flipped classroom emerged as an explicit concept in the early 1990s when two teachers in Denver, Jon Bergmann and Aaron Sams, developed a way to ensure students who regularly missed class due to extra-curricular activities or illness did not fall behind. Essentially, the teachers used recording software to record their lesson delivery which could then be accessed by students who had missed classes to enable them to keep up.

The flipped classroom can now be defined as a pedagogical method, “which employs asynchronous video lectures and practice problems as homework, and active, group-based problem solving activities in the classroom.” (Bishop & Verleger, 2013). In recent years, the practice has grown substantially and has proven consistently well-received among educators and students at both the K-12 and tertiary level.



Before

Students prepare to participate in class activities.



During

Students practice applying key concepts with feedback.



After

Students check their understanding and extend their learning.

The Flipped Classroom Model

Perhaps what makes the flipped classroom interesting is that it is a good example of a development that blends real teaching practice and technology. It is a method that allows teachers to adapt the technological instruments (camera, screencast software, presentation software etc.) to their specific needs and the particularities of their classroom.

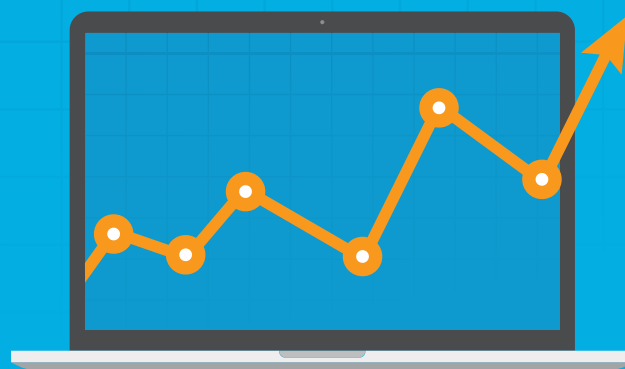
This is a very useful function of flipped classrooms, however it is not the only one. Beyond its practical utility as a convenient means of enabling students to keep up to date, the flipped classroom has potential to offer a range of other genuinely meaningful supports for teaching and learning.

Fostering surface to deep learning

First, flipping the classroom allows direct instruction delivery to occur outside of the classroom and constructivist pedagogies like problem based learning to occur during class time. In turn this allows for effective surface to deep learning, through problem based learning, inquiry based learning and their ilk.

Direct instruction, associated with behaviourist learning theory, and practices like inquiry learning, associated with constructivist learning theory, are often cast as incompatible or opposed. However, it is more useful to think of them as connected. In his comprehensive and highly influential study of the effect sizes of various aspects of teaching Hattie notes that the, "art of teaching is to balance the need for surface knowledge with deep processing of this knowledge" (Hattie 2015: 14). Direct instruction has been identified as an effective way of generating surface understanding of facts, a necessary precursor to deeper understanding, whereby students can connect and extend many ideas, which is effectively fostered through practices like problem-based and inquiry learning.

In turn, flipped learning offers a means of overcoming the incompatibility by allowing direct instruction to occur through digital delivery prior to class to develop surface level learning, while problem based learning can occur during class to allow deeper processing of knowledge (Bishop & Verleger, 2013). This is a meaningful way in which flipped learning can move from simply enabling knowledge consumption to better supporting knowledge production.



Enabling differentiation

Effective assessment, particularly diagnostic and formative assessment, is a crucial component in boosting students' progress. Indeed, the New South Wales Centre for Education Statistics and Evaluation has noted that, "the best [education] systems all use effective assessment and data to drive improvement" (CESE, 2014: 16). The reason assessment data is a powerful tool is because it allows teachers to differentiate effectively (CESE, 2014: 16; Goss, Hunter et al., 2015).

Indeed, with regards to differentiation, modelling by The Grattan Institute has shown, "[i]f all teachers targeted their teaching... it could lift performance enough to put Australia among the top five education systems in mathematics, reading and science in the PISA assessments." (Goss, Hunter et al., 2015: 7). Furthermore, targeted teaching would allow all students to better engage with curriculum thereby boosting student engagement, outcomes and positive learning behaviours while reducing disengagement, students falling behind and negative learning behaviours.

Again, the flipped classroom offers itself as a useful aid in enabling educators to differentiate and target their teaching. Because students undertake a portion of the learning necessary for the class prior to the lesson itself, the teacher can formatively assess students to check for understanding of content before commencing the lesson. In turn, if there are gaps in understanding or areas of difficulty these can be identified more accurately and addressed more efficiently.

“ Flipped education is able to provide educators with formative information about what students understand and might struggle with...to bridge the gap between where they are and where they need to be.”

Enhancing feedback

Effective feedback – while certainly not a new development in education - has become the focus of serious attention in recent years. Spurred largely by the meta-analysis undertaken by Professor John Hattie, feedback has become a watchword for teachers, schools, policy makers and researchers Australia-wide (Hattie, 2009). There are a number of types of feedback as well as a range of levels of feedback from task-oriented to feedback focused on self-regulation all of which are important in-and-of-themselves (Hattie, 2011).

Indeed, CESE, drawing on OECD data, has found that in Australia students whose teachers discussed student work after they had finished assignments performed significantly better than students whose teachers rarely discussed student work (CESE, 2015). Furthermore, they found that effective feedback helps students become more self-regulated learners who take control over their own learning processes (CESE, 2015). Feedback, then, is another important feature of effective classroom practice.

Again, flipped classrooms offer a number of means by which feedback can be enhanced. First, as is noted above, flipped learning is able to provide educators with formative information about what students understand and they might be struggling with.

In turn, this enables the provision of task-oriented feedback in class that helps students to bridge the gap between where they are and where they need to be (Hattie, 2011).

Another very interesting innovation in flipped education that can serve to enhance feedback is the use of “flipped feedback” that is instead of the traditional “red-pen” method of written comments, educators deliver feedback through video which can be provided to individual students, used as an exemplar for a class and given to parents as well. Again, this provides an innovative method of providing further feedback to learners.

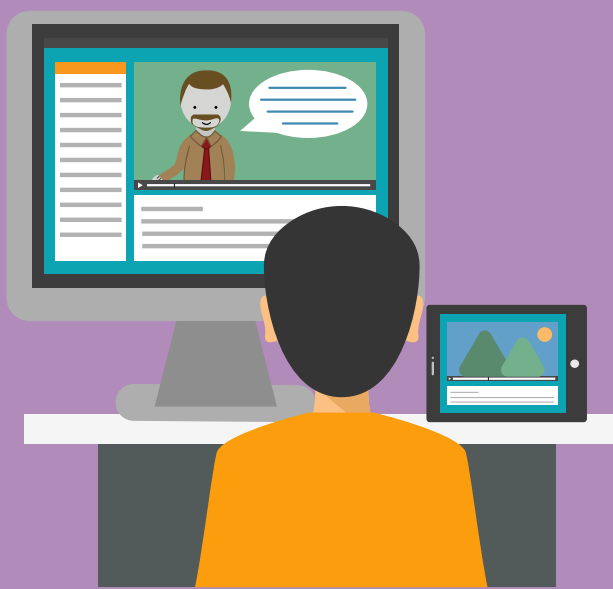
Takeaways

These then are three crucial ways in which flipped learning can potentially serve to support teacher practice. It is important to re-emphasize that the flipped classroom model, like any development in educational technology, works best when adapted by teachers to the needs and contexts of their classrooms and students. The flipped classroom does, however, offer a very fruitful pathway for this because it relies on teachers and students for it to be effective.

In terms of broader goals, however, what role could flipped education play in the bigger picture of Australia’s educational narrative? Returning to ACER CEO Geoff Masters’ five core requirements for improving Australia’s educational outcomes, it is possible to draw links between the potential of flipped education to contribute to three of these five core requirements:

- Increase reading, mathematical and scientific literacy levels
- Ensure every student has access to excellent teaching
- Reduce the long tail of students who fall behind

The reason this is possible is because these three core requirements point to the pivotal role of educators in lifting Australia’s educational fortune. In turn, as educators draw on various tools to boost literacies, provide excellent teaching and reduce the long tail of students falling behind the flipped classroom provides a very fertile digital method to enhance teaching practice, deepen teaching impact and in turn boost outcomes and progress for students.



Flipped educators on ClickView

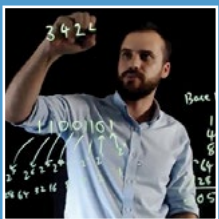
ClickView believes the flipped classroom instructional model is an exciting frontier in the incorporation of video and education. One of the core reasons behind this excitement is because the flipped classroom is so consistently endorsed by practicing educators who implement the model.



Jeremy Le Cornu
Brighton Secondary School
@MrLeCornu

The main benefit of flipped learning is the ability to maximise face-to-face class time with students. The most

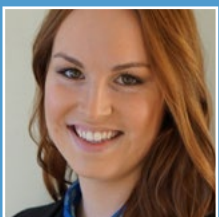
important impact on my teaching practice is that I can easily speak to every student in my classes every lesson. It means that every lesson I've got time to get around to each student and find out, 'how are you actually going?'. Because I can individualise it like that, it means that it's much more beneficial for students.



Joel Speranza
St Josephs Nudgee College
@JoelBSperanza

The flipped classroom takes instruction out of the class and into the home, which allows the classroom to be

used as a collaborative learning space. This allows students to spend lessons actively engaging in the process of learning. My classrooms have changed so much since flipping that I've become a massive advocate for flipped learning.



Aimee Shattock
Brighton Secondary School
@MsShattock

As a result of flipped learning, my classroom has become increasingly student-focused. It's made me rethink my

approach to both content and class activities. Flipping my classroom has allowed for more differentiation and one-on-one time with students, and they regularly comment that they like that I have a lot of time for them.

ClickView's Contribution

Flipped learning then has the potential to make a demonstrable contribution to deepening teacher impact and boosting student progress. It is unique in a way because it relies on a medium not specifically developed for educational purposes: video. It is perhaps more accurate to recast the flipped classroom away from being an example of educational technology to an example of technology being repurposed for education. That is, the real education has very little to do with the technology itself and much more to do with the educator and the students using it.

In turn, given its unique position at the interface of video and education, ClickView is uniquely positioned to contribute to enhancing the flipped learning process. ClickView is a company driven by the belief that video can be an effective force in education. In turn, the entire organisation works to develop, support and harness the educational potential of video and new developments in video.

ClickView considers the flipped education movement to be a very exciting frontier in education. Indeed the process of teachers creating videos to deliver lessons based on curriculum for their students to increase their own impact represents perhaps the epitome of how video can be used for education. Given the alignment of this practice with the values of ClickView as an organisation, ClickView is working hard to support flipped teachers and create tailored software that can facilitate flipping the classroom and boost its value for educators and students.

ClickView works closely with flipped educators around Australia to ensure the product it develops meets their actual needs and serves to enhance the process of flipping the classroom. As such, there are a number of means by which ClickView can enhance the process of flipped education.

Fostering surface to deep learning

First, ClickView's suite of interactive tools provide a powerful way to add a layer of interactivity to any flipped lesson. Whereas flipped lessons may have involved associated worksheets or homework activities to ensure students were engaging with the videos, ClickView's interactive features enable educators to add questions, annotations and imagery to engage and emphasize aspects of the lesson. This includes short answer questions which can be structured along Bloom's Taxonomy to

ensure a range of higher and lower order thinking is engaged. Indeed, interactive features stand to add a valuable dimension to the direct instruction style of learning facilitated by flipped lessons.

Direct instruction involves building knowledge through systematic instruction that introduces facts in a linear manner (as opposed to the non-linear style which characterises constructivist learning methods like problem based learning). Research has found that interactive learning environments, like interactive videos, tend to result in students undertaking a more systematic (i.e. more linear) approach to their work (Timms & Lodge, 2015). In turn, students who approach interactive learning environments in this systematic manner performed better on post-tests as opposed to students who did not (ibid.)

This indicates that interactive learning environments, such as an interactive flipped lessons, encourage a systematic approach to comprehension, which in turn has proven to be a more effective means of surface learning. In turn, this opens up richer opportunities for deeper understanding to be developed in class time using constructivist pedagogies like problem based learning, which tend to be most effective when preceded by surface learning (Hattie, 2015).

ClickView's interactive features, then, offer both an intuitive and pedagogically meaningful method of boosting the effectiveness of flipped lesson videos to help facilitate the surface learning process.

Enabling differentiation

ClickView has also developed tools to assist teachers to differentiate and target their teaching through the analytics that complement ClickView's interactive features. Essentially, interactive videos process a variety of information ranging from who did and did not watch the assigned video, who skipped parts, who answered what and how, it can even provide data on when videos were watched. The potential of this information to an educator provide rich insights into the learning patterns and behaviours of their students is significant.

Most prominent though is that this will enable teachers to understand how each member of their classroom is going both individually and in relation to the rest of the class. The data will also allow teachers to gain broader insights into whether there are significant gaps in learning across the class. Importantly, if these interactive videos are completed prior to the lesson teachers will be able to gain all of

these analytics before even entering the classroom thereby enabling them to plan proactively. This will provide an extremely useful tool for targeted teaching, which research shows is an incredibly powerful tool in helping student to progress (Grattan Institute 2015; CESE).

Enhancing feedback

Finally, ClickView's interactive tools and associated analytics also stand to enhance the provision of feedback. As noted above, effective feedback has been singled out as one of the most powerful tools for deepening an educator's impact and spurring student progress. ClickView's interactive video features and analytics combine to provide educators with clear and usable formative assessment data. Indeed, Michael Timms and Jason Lodge from ACER and The University of Melbourne have found that embedded interactive features form the basis of strong formative assessment (Timms & Lodge, 2015).

As such interactives offer useful assessment for learning as educators can enter the classroom with a clear snapshot of where each student is situated. It serves as a highly useful complement for other forms of assessment for learning which, taken together, can help in delivering precise feedback.

On the flip side, analytics from interactive lessons also provides useful feedback to teachers as they can gain both snapshots and longitudinal information about student comprehension. Importantly, Hattie has made the point, "Assessment needs not only provide feedback to students about their learning, [but should] also provide feedback to teachers about their methods." (Hattie, 2011: 10)

The analytics associated with ClickView's interactive features allow for patterns to be discerned that indicate where students may consistently struggle with a concept or topic and provide valuable feedback to the teacher. In turn, adjustments can be made to a flipped lesson or misunderstanding addressed in class before a flipped lesson is undertaken. Either way this form of feedback, according to Hattie, is very powerful for increasing teaching impact.

Takeaways

These then are three ways in which ClickView as a platform is seeking to support flipped teachers in creating powerful flipped content that deepens their impact and furthers student progress. ClickView understands that technology is auxiliary to education

and the educator, as such it seeks to serve the needs of teachers rather than create new needs. The tools and software developed by ClickView are always designed with the needs of teachers in mind and, in turn, it hopes to play a role in increasing educational outcomes by helping teachers in doing their work.

Conclusion

The purpose of this report was to examine the potential contribution that flipped classrooms can make to broader systemic efforts to lift Australia's educational fortunes.

Authoritative research has demonstrated conclusively that in terms of reading, scientific and mathematical literacy Australia's performance has declined between 2000 and 2012. These declines bring in train negative consequences for Australian students economically and socially. The declines therefore need to be addressed as a matter of priority.

It is the role of multiple stakeholders to address this decline, not just teachers who are already working hard in this respect. The Educational Technology sector is one of these stakeholders and the sector must rise to the responsibility of supporting educators in the pursuit of lifting Australia's educational performance.

The flipped classroom practice is one application of educational technology that holds promising potential to assist educators in a meaningful way. The flipped classroom enables effective connection of direct instruction and constructivist learning methods which in turn facilitate surface to deep learning. Furthermore, the flipped classroom helps teachers to differentiate more effectively and can aid in the delivery of effective feedback.

As an educational technology company built around a belief that video can be an effective part of education, ClickView is uniquely positioned to support this method of teaching as the flipped classroom brings together video and education in a precise and meaningful way.

Through constant consultation with teachers and ongoing software development ClickView is working on ways to support teachers in further realising the educative potential of flipping the classroom.

The work of lifting Australia's educational performance requires the meaningful engagement of all stakeholders to work in alignment. Educational technology will not 'fix' education, no single

“Educational technology will not ‘fix’ education, no single stakeholder can. However, educational technology does have the potential to play a very meaningful part in pushing Australia's education system out of its current decline.”

stakeholder can. However, educational technology does have the potential to play a meaningful part in pushing Australia's education system out of its current decline.

In turn, the flipped classroom is one specific application of technology to education that appears to be having a demonstrably positive impact in supporting teachers in helping their student's progress.

ClickView believes the flipped classroom is a genuinely positive innovation in education and stands ready to play its part in fostering this practice, supporting teachers and lifting Australia's educational performance.

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About Rupert Denton

Rupert is a Secondary School teacher who has joined the ClickView team as Community Manager. Rupert is passionate about using technology to improve student outcomes and makes regular use of technology across his teaching. Rupert holds degrees from the University of Melbourne and the London School of Economics and has extensive content knowledge and teaching experience across the Humanities. When he isn't in the office Rupert is making his own flipped classroom videos and writing and producing comedy of variable quality.



About ClickView

As educators, we know that each student learns differently. We believe that video is the perfect way to engage with any student, despite differences in learning styles. At ClickView, our goal is to give teachers the best opportunity to create a rich learning experience through video education for students.

From the videos we produce right here in Australia, the flipped classroom videos created by our community, to the free-to-air TV programs we curate; ClickView is revolutionising how video can be utilised to increase student engagement and boost student outcomes.

All our videos and activities have been mapped to the Australian Curriculum, designed by educators to support students, and are available anywhere, any time on our user-friendly online platform.

Contact Us

ClickView Australia
Suite 125 Jones Bay Wharf
26-32 Pirrama Road
Pyrmont NSW 2009

Phone: 02 9509 2600
Fax: 02 8214 5862
info@clickview.com.au
clickview.com.au

