

# RAPID RESPONSE REPORT

## AFTER COVID-19: THE LONGER-TERM IMPACTS OF THE CORONAVIRUS CRISIS ON EDUCATION

The ongoing global shock of the COVID-19 pandemic and its likely societal, political and economic repercussions look set to dominate how the 2020s unfold in significant ways. Here are twenty-one predictions for what's to come from education experts from across Monash University.

The ongoing coronavirus pandemic (COVID-19) is stress-testing all aspects of society in uncomfortable and unsettling ways. In terms of education, COVID-19 has already stretched our education systems to breaking-point. By the end of March 2020, school closures had affected over 1.3 billion children and young people across the globe – that is nearly 80 per cent of the world's population of school students. In Australia, NAPLAN testing has been cancelled, universities turned over to online provision, and museums, libraries and galleries all shut until further notice. The educational landscape has altered dramatically over the course of a few weeks.

At the moment, many people are finding it difficult to think about anything other than how to cope with the immediate difficulties thrown up by the crisis. However, if we look beyond the short-term challenges then the pandemic looks set to reorder many aspects of society – education included. If nothing else, likely societal, political and economic repercussions of COVID-19 are set to dominate how the 2020s unfold in dramatic ways. On a personal level, people's habits, perceptions and outlooks are likely to shift – for better and worse.

All of this means that we need to start thinking beyond the current upheavals, and consider the post-pandemic probabilities and possibilities. While no-one can be certain of the future, here are twenty-one informed guesses at how Australian education and society might change.

### MENTAL HEALTH AND WELLBEING

---

#### Dealing with long-term mental health repercussions

Australians are experiencing restrictions across many social events such as weddings, sports and movies. With such a large focus on physical distancing and lockdowns it is easy to forget about the social aspects of these changes. If governments, communities and individuals do not equally focus on the mental health impacts of COVID-19, there are likely to be long-term mental health repercussions. The impact of COVID-19 on the mental health of our communities is unfolding daily, with predictions of a 'social recession'.

A social recession can have profound physical, economic and psychological effects. Though we are in uncharted territory, data suggests that quarantine can seriously affect people's mental health, leading to anger, confusion and post-traumatic stress symptoms.

As this pandemic continues, the continuous provision of mental health information is critical. Honest and fast communication about how to reduce isolation and increase connection while physically distancing is essential. Health messages need to also include specific ways to look after your mental health. As governments and health regulatory bodies respond to the impacts of the pandemic, an interdisciplinary expert task force on the short- and long-term mental health effects is urgently needed to address the potential risks and repercussions for children, youth, adults, parents, families and the community.

**Christine Grové is a lecturer in educational psychology and inclusive education who researches in the area of child and youth mental health.**

### Rekindling a sense of school belonging

COVID-19 has caused students to experience a variety of school disruptions, ranging from near-empty classrooms to full campus shut-downs. While a sense of school belonging is a vital psychological need for all children, the thousands of vulnerable children who rely on school for safety, social support and even breakfast programs have undoubtedly felt the most impact. Their sense of belonging to school may be challenged even by the slightest threat of exclusion from school, let alone a school closure. How can we belong to a place to which we have no access?

This pandemic will have caused many students to question their schools as places of belonging. Suddenly, schools that usually offer a predictable and unerring place of belonging have given way to uncertainty, undermining the many benefits they offer. When the shutdowns are eventually lifted, schools and teachers need to be sensitive to the potential break of trust. Research shows that disruptions to students' belonging can have a detrimental impact on short- and long-term wellbeing, academic engagement, relationships with others, and positive development into adulthood. The feeling of 'being back' in school will not happen immediately when the school gates are re-opened.

**Kelly-Ann Allen is a senior lecturer in educational psychology and inclusive education who researches school belonging.**

### Opening up schools for physical activity

For children and young people, the COVID-19 school closures took away crucial sources of physical activity, from HPE lessons to lunchtime clubs. In addition, community lockdowns saw the abrupt shut-downs of gyms, sport centres, park-runs and other regular exercise routines. It was then heartening to see people around the world taking to parks, pavements and playgrounds to hold impromptu exercise sessions, from daily walks through to full-blown workouts. We also saw a boom in online exercise at home, with millions of people joining YouTube fitness celebrities such as Joe Wicks for daily exercises. Many of these activities saw families being active together, despite the lack of formal facilities.

After the disruption of the pandemic fades, it would be great to think that schools can play a part in sustaining this enthusiasm for informal physical activity. As well as supporting students to continue their out-of-school activities, this will be a great time to open up access to schools as places where all people can be active. At the moment, many schools do not even allow their own students (yet alone the rest of the community) to access sports grounds, basketball courts, and other school facilities outside of school hours. Thinking creatively about how whole communities can regularly access school-based spaces could be a great way of keeping us all physically active.

**Ruth Jeanes is an associate professor who researches sport, active recreation and community development.**

*Thinking creatively about how whole communities can regularly access school-based spaces could be a great way of keeping us all physically active. (Ruth Jeanes)*

## SOCIAL INEQUALITY

### Addressing inequalities between students and schools

We know that income, health and education inequalities are closely interlinked. Those who are disadvantaged in one of these areas tend also to be disadvantaged in the others. Emergencies usually put the livelihoods of those already in disadvantage at a much higher risk, and the emergency caused by COVID-19 is no exception. The increasing shut-down of schools across Australia has highlighted the inequalities inherent in taking students out of the relatively 'level-playing field' of school. Not all students live in well-resourced households with parents who are able to support their school work. Hence, COVID-19 has the potential to exacerbate existing education inequalities. Therefore, in the short-term, it is crucial to provide additional support to traditionally disadvantaged students and schools when students return to school.

In the meantime, those who work from home rely on those who do not to keep their lives running, from grocery store employees to courier drivers and health care workers. Hence, securing quality schooling for all children in times like these becomes not only a matter of social justice but an essential task to keep the system working. Hopefully, COVID-19 will encourage the social and political will required to promote the more holistic and thorough reforms that are required to tackle inequality between schools. If not because it is fair, at least to be prepared for the emergencies that the future holds.

**Beatriz Gallo Cordoba is a research fellow in Education Futures who works in the area of quantitative educational research.**

### Boosting teachers' capacities to teach online

COVID-19 has seen many schools quickly shut down campuses and switch over to online teaching. The scale and speed of this move online has caught many teachers and schools off-guard. People have coped the best they can, but the quality of what can be done online has often been compromised. The pandemic has certainly highlighted a big gap in teacher education and professional development.

So what can we do next? Countries like Australia clearly need a new generation of school teachers who will be comfortable with any future rapid, large scale shifts to online teaching and learning. In this sense, universities now need to pay serious attention to having educational technology subjects front-and-centre of all teaching degrees. The more difficult challenge will be to boost the knowledge, skills and confidence of the teachers who are already working in schools. This will require governments to commit to sustained programs of professional development. Teaching online is definitely a skill that takes time to perfect.

**Mike Phillips is a senior lecturer who researches teachers' work in technology-rich contexts.**

### A time to ask critical questions about digital learning

The closing of schools and rapid switch to online tuition has illustrated how flexible our education systems can be. Social media has been full of families celebrating the new-found freedoms of this enforced screen time – a chance to learn new skills and explore different subjects together through the internet. Elsewhere the EdTech industry has celebrated what they see as an unexpected business opportunity, a tipping-point after which schools and universities will finally adopt digital education as a mainstream mode of teaching and learning. However, civil liberties groups and activists have increasingly raised concerns over the privacy and surveillance implications of hundreds of millions of students being forced onto commercial software that has not been properly tested and vetted for educational uses.

These diverse reactions highlight the fact that technology use in education is never a neutral tool or easy fix. There are always wider connotations and unintended consequences of adopting any technology in education. So, in the aftermath of COVID-19, all schools and universities need to take a good look at the haphazard technological arrangements that got them through the lockdown crisis. Who stands to profit from the use of this technology in education? What forms of control are being established? Which students stand to benefit most from learning online. In short, what is lost, as well as gained, when education goes digital?

**Carlo Perrotta is a senior lecturer who researches digital education.**

*COVID-19 has demonstrated that there is something irreplaceable about students and teachers coming together to learn in person. (Neil Selwyn)*

### Heightened awareness of the limits of digital 'solutions'

I hope that one of the educational legacies of COVID-19 is a more realistic conversation about the limits of digital technology and education. The past few years have seen growing enthusiasms for online education, personalised learning systems and virtual classrooms. These technologies definitely have their place, but, now that everyone has first-hand experience of a mass shift to online learning, we should all be well aware of the many practical problems that lie behind this hype. COVID-19 has demonstrated that there is something irreplaceable about students and teachers coming together to learn in person. Online videos, digital content and discussion forums are very different (and often inferior) forms of schooling.

In particular, I hope that educators will have a heightened awareness of the many digital inequalities that persist in society. Rather than presuming that all students (and educators) have perfect 'always-on' connectivity and powerful devices, it is clear that significant digital divides persist, with large numbers of people lacking the basic technology access to work outside of school and university. If we are serious about moving to forms of digital education, then governments, ISPs and telcos need to provide free access to devices and the internet for those households without the technology.

**Neil Selwyn is a distinguished research professor and author of *Should Robots Replace Teachers? AI and the Future of Education* (Polity, 2019).**

### Virtual education with a sense of place

The COVID-19 school shut-downs have pushed many teachers and students unexpectedly into fully-online modes of learning. This is proving a disorientating experience for many reasons, including the sudden loss of everyone's shared 'sense of place'. Face-to-face campuses and classrooms are a brilliant way of giving students a common lens through which they experience and make sense of teaching and learning. For all its faults, face-to-face schooling is an effective means of supporting what experts term 'situated learning', a common sense of identity, and shared understandings of the world in which we are all part.

These qualities are proving much harder to replicate in the virtual learning spaces that many schools have been thrown onto during the pandemic. Poorly-designed online education can quickly become sterile and desensitizing, leaving

students and teachers feeling uprooted and disembodied from the learning material. It is my hope that people's experiences of online learning during COVID-19 will lead to more careful future planning and designing of virtual schooling. Online learning does not have to involve countless video-meetings, online assignments and quizzes. More creative and engaging forms of virtual schooling are possible that support place-based teaching and learning practices. This will require school-specific platforms being designed for, and by, teachers and students. Once schools have moved past the current online struggles, it will be high-time to discuss how virtual education could be better.

**Bronwyn Cumbo is a research fellow who researches children and young people, and participatory and critical approaches to designing emerging digital technologies.**

*This situation presents an opportunity to think about how and where societies invest in education and training. Education and training can equip people to adapt to changing circumstances. (Lucas Walsh)*

## WORK AND THE ECONOMY

### Dealing with the economic downturn

COVID-19 is a possible tipping point into an economic downturn that has been imminent for some time. Current indicators suggest that the severity could be far greater than the global financial crisis of 2007–8. As before, we can expect steep rises in unemployment, debt and precarity in general. However, this time around these effects will be notably different. Firstly, labour markets have become more fluid and precarious. The rise of non-standard forms of part-time, short-term and casual employment means that swathes of workers will be immediately and significantly impacted by an economic downturn. Particularly vulnerable are young people, who might lack experience and networks to gain employment. Rates of unemployment tend to be two to three times higher than the working population as a whole. Older people might face the stigma of being labelled untrainable.

What is also striking about the likely downturn is how underprepared we will all be. Businesses and households are already highly in debt, and governments may quickly exhaust financial firepower to respond to a downturn. As such, sustainability is key here. This situation presents an opportunity to think about how and where societies invest in education and training. Education and training can equip people to adapt to changing circumstances. A range of approaches ideally attends to everything from financial literacy (e.g. minimising debt) to mental health, upskilling and retraining, and perhaps most importantly, making education and training as easy as possible for people to access.

**Lucas Walsh is Professor of Education Policy and Practice, Youth Studies, who researches youth transitions.**

### Boom or bust for tertiary education

A severe and prolonged crisis such as COVID-19 looks set to disturb the relationship between education and employment. Usually, periods of economic downturn see people turning to the tertiary education sector for retraining, gaining more qualifications, and even simply waiting out the financial storm. However, the likely economic downturn prompted by the pandemic looks set to be far more serious than we have experienced before – even during the global financial crisis of 2008. Unemployment and job casualisation could likely be extreme, and will affect nearly everyone across the occupational spectrum, especially young people.

There are two ways this might play out for tertiary education. On a positive note, we might see a renewed interest in identifying the types of educational qualifications and skills that seem to have helped people to remain in employment. This might point to 'pandemic-proof' forms of education that universities and colleges can begin to roll-out and expand. On the other hand, COVID-19's frightening negative economic impact on the entire economy might call for extreme labour market policies that leapfrog tertiary education altogether. We might see the resurgence of ideas such as universal basic income for young people, wage subsidies, living wage, rent subsidies, debt-forgiveness, and other stimulus and targeted relief packages. In this latter scenario, it might be a while before tertiary education's fortunes begin to rise. Only time will tell.

**Bertalan Magyar is a research fellow in Education Futures who researches the economics of education.**



## SCHOOL LEADERSHIP

---

### The invisible labour of educational leadership

In the past decades, we have reduced educating to a simple balance sheet, achieving high test scores and outperforming other nations in league tables. But this pandemic reveals in its starkest form what educators have always known: educating is so much more than that. This crisis reveals that educational leadership is a collective social responsibility. For example, in Armidale, NSW, the public schools are teaming up with community advocates who have built trusting relationships with refugee families to ensure the children and their caregivers are OK, that their learning needs are being met, that they have sufficient food on the table, and that there is a caring person on the end of the line.

This kind of leadership is the invisible labour that public school principals and teachers in disadvantaged schools perform every day. It is their fingers in the dike, plugging the gaps from decades of neglect in public infrastructure. If I had one wish out of this crisis, it would be a bipartisan agreement for equitable, sustained and serious government investment in our institutions: public education, housing, a strong welfare net, a labour market with decent incomes and conditions. That is how we can best support our children. It is a very different form of leadership to that which we have rewarded until now. And it is long overdue.

**Jane Wilkinson is Professor of Educational Leadership who researches educational leadership for social justice.**

### Leading schools online

The shut-down of school campuses and switch over to online tuition has necessitated a significant shift in practices and mindsets for school leaders. There is already evidence from around the world that some schools have struggled to maintain the same ways of working. This has led to increased over-work, stress and monitoring of teacher practice. One of the big lessons that must be learned from the COVID-19 shut-down is that school principals need to be better prepared for future disruptions when online alternatives will again be called into action. This suggests a range of competencies that should now be developed in current and future school leaders.

Leading an online version of school requires principals to rethink expectations and understand that the status quo has shifted. The pandemic has shown us how pre-existing school visions and goals need to be put on hold in favour of building up students' and staff members' sense of safety and support. School leaders need to reimagine modes of curriculum planning, assessment and reporting. A lot of this can be achieved by trusting teachers' professional autonomy and judgment, and ensuring clear and compassionate communication with all members of their school community. Perhaps most importantly, there is also a need for leaders to think differently about their own work, and to work with their colleagues and support networks to ensure their own health and wellbeing during a deeply challenging time.

**Amanda Heffernan is a lecturer in leadership who researches the working lives of school principals.**

*This crisis reveals that educational leadership is a collective social responsibility. (Jane Wilkinson)*

## TEACHERS AND THE TEACHING PROFESSION

---

### Recognising teachers as frontline workers

As soon as the worst of the pandemic is over, I would like to see mental health and wellbeing being prioritised in our education system. COVID-19 is already a source of heightened stress and anxiety, and there will be ongoing emotional, social and economic impacts for many Australian families. As such, educators need to be viewed as frontline workers for children and families as they attempt to recover from COVID-19.

In particular, I hope that our politicians and community begin to value the wide range of roles that teachers play. Teachers take on the work of being educators, social workers, counsellors, outreach workers, case managers and

foodbanks. I would like to see teachers being better supported in these roles through appropriate training, ongoing support, and improved access to social workers, psychologists and counsellors in all Australian schools.

Recovery from COVID-19 will be very slow for many children and families, and it will be teachers who support and campaign for our most vulnerable families. Above all, I hope that at this time of school closures and online teaching, politicians and public finally see the many layers of what it means to be a teacher and find ways to support Australian teachers as they attempt to glue communities back together after COVID-19.

**Emily Berger is a lecturer in educational psychology who researches child trauma.**

### Increased respect for the teaching profession

Teachers have been thrust to the frontline of the COVID-19 pandemic. They were quickly framed as essential workers, tasked with maintaining a business-as-usual front. The burden of this positioning has had a profound impact: teachers have reported feeling sacrificed, invisible and abandoned. For example, before school closures came into force, teachers' fears around risk of transmission were heightened by vague safety and health measures, and the impossibility of social-distancing in overcrowded classrooms. Subsequent early closures of Independent schools emphasised the social inequity in Australia's system.

Despite this, teachers invested time and resourcing into converting their conventional lessons and class activities into online forms. They demonstrated adaptability, collegiality and creativity to ensure their students remain connected to school. I hope one of the outcomes of COVID-19 is a teaching workforce that feels rallied and emboldened by their treatment as pandemic frontline workers. Teachers should feel well-placed to demand better pay, conditions and esteem for the profession.

**Stephanie Wescott is a PhD student, teacher educator and research assistant. She previously taught English and humanities in a Victorian government school.**

### Rethinking what aspects of teachers' work really matters

COVID-19 has seen education stripped to its essential parts. As schools have strategised to move online, it has been necessary to rethink what matters and what is worth doing under these conditions. Schools have abandoned goals to improve NAPLAN data; the roll-out of professional learning communities has been halted; and the completion of performance and development plans have been deserted. These tasks normally consume a substantial amount of teachers' time and are considered both essential and important.

The aftermath of the pandemic should prompt a critical rethinking of what matters in teaching. With teachers expressing hopes that time at home will open possibilities for play, freedom and creativity, a revolutionary re-imagining of the daily work of teaching (and the purpose of schooling) is possible.

**Stephanie Wescott is a PhD student, teacher educator and research assistant. She previously taught English and humanities in a Victorian government school.**

## SCIENCE AND MATHS EDUCATION

---

### Science and maths education that is needed for the future

I would hope that the legacy of COVID-19 is a greater focus on why science and maths education are important: that it is not about the accumulation of knowledge or facts, but rather how we use our science and maths knowledge as an educated citizen. The current multiple sources of information about the COVID-19 virus has highlighted the inadequacies of our current approach to science and maths education. The general public should know how to recognise trusted sources of scientific information, be able to scrutinise some of the data that is presented and communicated, understand the different models that are presented and make some judgements about the reasonableness of such models.

The current crisis has demonstrated that a serious rethink of what is important to know and be able to do is needed. The existing curriculum and school structures will need to be changed, as they have been shown to be inadequate in this current climate. Clearly schools are important social institutions and how we collaborate in learning together in more authentic and integrated ways must be an important part of curriculum and schooling of the future. They also need to be in concert with current global imperatives such as sustainability. Science and maths education must contribute to every citizen being able to play their part in such global imperatives in the future.

**Deborah Corrigan is Professor of Science Education and Director of Education Futures.**

### Learning lessons over data controversies

The coronavirus has been accompanied by a wealth of data science, much of which has been poured over by the public who are keen to gain a sense of certainty around what is clearly a very uncertain situation. At best, this has seen the wide take-up of public campaigns based around the data-driven logic of 'flatten the curve'. At worse, this has seen legions of 'armchair epidemiologists' taking to social media to offer uninformed (and often incorrect) analyses of trends, predictions and projections. Even well-intentioned use of statistics has since proved misleading, such as conflating the initial mortality rate figures in China with what would happen in other countries with very different contexts.

The aftermath of the virus will involve thorough retrospective analysis of the data by experts and statistical confirmation of what actually happened. This would be a great opportunity to keep the public engaged. The news media can help publicise which data sources were trustworthy, and also what they got wrong. Conversely, we should be loudly publicising which widely-circulated 'facts' from non-experts were actually based on faulty logic or plain misinformation. While the statistics mask the tragedy of the pandemic, COVID-19 can at least act as a valuable educational moment about being more critical in the data 'controversies' that rage in other ongoing crises – not least over climate science.

**Beatriz Gallo Cordoba is a research fellow in Education Futures who works in the area of quantitative educational research.**

### Investing in adult numeracy education

The COVID-19 pandemic has pushed issues relating to public levels of numeracy to the fore. Lay-people have been struggling to make sense of statistical analyses and graphical representations presented in the media. While experts have been working wonders to make their analyses understandable, there are limits to how simplified the data can be made. For example, the majority of the public have had an understandably difficult time understanding exponential curves and logarithmic scales, topics that some adults may not have encountered during their time at school, and that others may have forgotten.

In addition to difficulties understanding the COVID-19 data, the worldwide panic-buying of toilet paper and pasta was

driven, in part, by innumeracy. While heightened levels of fear, greed, and social media misinformation played a big part, these irrational behaviours were also driven by people's inability to estimate and extrapolate how much toilet paper they would need for, say, a month. Improving levels of public numeracy would not put a stop to the pandemic, but it would help reduce public anxiety and disorder. A crucial aspect of being a numerate adult and citizen is being a critical consumer of information presented in the media. Life-long numeracy skills need to be nurtured in the general adult population in order to develop a numerate – and in particular, a statistically literate – society.

**Jennifer Hall is a lecturer in mathematics education who researches the relationships that students form with mathematics.**

*Science and maths education are important: it is not about the accumulation of knowledge or facts, but rather how we use our science and maths knowledge as an educated citizen. (Deborah Corrigan)*

## RETHINKING EDUCATIONAL VALUES

### A time for connection and compassion

One of the good news stories during COVID-19 was a sense that the planet might be benefiting from a temporary slow-down in human activity. China reported a 25 per cent reduction in greenhouse gas emissions after only two weeks of lock down and images celebrating the return of animal life to urban centres were circulated widely through social media. At the same time were fears that COVID-19 might distract us from all the concerns that were previously top of many people's minds before the virus spread, including climate change, bushfires and similar global crises.

Of course, climate change will neither be solved nor sidelined by COVID-19. Instead, the aftermath of the pandemic needs to be dealt with along with all our other ongoing problems, including climate change. Education can be an important factor in making these connections. This calls for a shift to a compassionate and restorative approach to education that supports the development of transformative skills in young people and adults. Education can be a key part of how we can work to build empathy, decrease polarisation, create stronger social solidarity, and encourage creative and generous problem-solving. Yet this requires a radical rethinking of our education systems – moving the focus of schools and universities away from individualised performance and competition, and toward a sense of education being a means of effectively and compassionately meeting global challenges.

**Kathleen Aikens is a research fellow in Education Futures who studies environmental and sustainability education.**

### A new way of doing university

COVID-19 has been a huge disruption for tertiary students. Not only have their studies moved wholly online, but so have many of the start-of-year social and orientation activities that are traditionally part of campus life. As such, it will be interesting to observe the return to daily, face-to-face student life once the need to self-isolate has passed. While most students are eagerly looking forward to returning, they may well have picked up a different set of behaviours and habits.

If so, then universities will have to be mindful of the need to adapt to their students' new expectations. These students might have optimised the habit of 'working from home', independent problem-solving skills, or improved comfort with studying wholly through online learning systems. Students might also be happier to socialise with each other online, rather than face-to-face. Of course, it is difficult to anticipate exactly how students' behaviours and habits will be altered in the future. However, universities will be welcoming back a cohort of students that have been given the unexpected opportunity to develop and experiment with new ways to learn, and new ways of taking part in campus life. Students might never be the same again!

**Catherine Waite is a research fellow in youth studies who researches youth sociology.**

## EVIDENCE AND ITS USE

---

### The value of evidence and the complexity of using it well

One of the potential (and let's hope actual) impacts of COVID-19 on the future of education is an increased appreciation for the value of evidence and the complexity of using it well. A stand-out feature of the response to COVID-19 internationally has been the importance of experts and evidence. Political leaders the world over have been quick to turn to researchers and scientific advisors for data and advice, and recent months have seen widespread discussion about the evidence underpinning decisions. I hope that these developments will open up new possibilities and increased recognition for the role and use of evidence in educational policy and practice.

More significantly, though, I hope that our experiences of responding to this pandemic will bring about a more realistic appreciation of what is needed to use evidence thoughtfully to improve education. The non-stop news coverage of COVID-19 has provided vivid insights into the complexities of using evidence to drive social change. And communities and individuals everywhere have had first-hand experience of the challenges involved in understanding and following evidence-informed advice. In relation to education, then, let's hope that these experiences stay with us as a reminder that evidence does not speak for itself but depends on skilled professionals to select and make sense of it, and decide whether and how to share, use and act on it in specific contexts.

**Mark Rickinson is an associate professor and Director of the Q Project, a five-year initiative to improve the use of research evidence in Australian schools.**

*The non-stop news coverage of COVID-19 has provided vivid insights into the complexities of using evidence to drive social change. Evidence does not speak for itself but depends on skilled professionals to select and make sense of it. (Mark Rickinson)*