What lessons have countries/ jurisdictions learned from unintended consequences?

The strategies introduced in the "Challenges and Strategies" section above could be options to address the time lag between today's curriculum and future demands. While the strategies may be helpful, they may also have unintended consequences. Some countries and jurisdictions have reported experiencing outcomes that were not anticipated when designing these strategies, which added further complexity to minimising the time lag.

As many countries have acknowledged, time lag is an issue of concern. Strategic foresight, careful planning and consultative and collaborative processes take time, but they contribute to achieving more sustainable and successful results.

The following five key lessons learned are generated based on actual country experiences. These lessons can be used as a checklist to reflect on the current state of play and avoid repeating similar unintended consequences that peer countries and jurisdictions have experienced.

> **Key lessons learned from unintended consequences on addressing time lag between today's curriculum and future demands**
>
> - Do not underestimate teachers' fear of the unknown and allow them space for mistakes.
> - Empower teachers, rather than diminishing their agency, when developing innovative curriculum through new educational technologies.
> - Acknowledge the need for incremental changes to the curriculum while maintaining aspirations for transformational change.
> - Avoid reform fatigue among stakeholders by designing synergies between curriculum change and other educational reforms.
> - Use structure and discipline when making changes to the digital curriculum, being aware of cyber security threats and personal data issues.

1. DO NOT UNDERESTIMATE TEACHERS' FEAR OF THE UNKNOWN AND ALLOW THEM SPACE FOR MISTAKES

Addressing the time lag between today's curriculum and future needs requires significant change, which may be met with resistance from stakeholders. Resistance to change may be especially strong among teachers when the nature of the change is unfamiliar (e.g. new concepts and use of new educational technologies) and the consequences on their teaching are unclear.

Such resistance is mostly due to a fear of the unknown, with teachers reporting being ill-equipped for such change, and to misalignment of new curriculum directions with teacher training programmes and guidance materials (see the "Research" section above and "Challenges and strategies" sections above). Teachers especially fear making mistakes in implementing the curriculum, which can mean that they continue to teach in a traditional way and students can potentially miss out on opportunities to develop future-oriented skills.

To prevent such anxiety and mitigate implementation lag, it is important to identify the barriers and concerns that teachers experience when implementing a new curriculum and to allow them to make mistakes. Awareness raising campaigns and

inspirational leadership could help motivate teachers for change. They also need to be reassured that the goal of change is attainable and that sufficient support (training, guidance and materials) will be provided throughout the implementation process. This would ultimately increase teacher agency, ensure their well-being and contribute to a sense of accomplishment.

Some countries/jurisdictions also reported positive experiences with teacher learning communities, where challenges are discovered by the group collectively and solutions emerge from within rather than via a top-down approach. By shifting the focus away from external forces back to the teachers, a new dialogue becomes possible, where change is a response to opportunities identified by empowered teachers.

Teachers' fear of the unknown when implementing future-oriented curriculum reforms should not be discounted. Instead, allow them to learn from their mistakes in the short term and aim for a healthy school culture in the long term, which inspires confidence and trust and ultimately empowers teachers.

2. EMPOWER TEACHERS, RATHER THAN DIMINISHING THEIR AGENCY, WHEN DEVELOPING INNOVATIVE CURRICULUM THROUGH NEW EDUCATIONAL TECHNOLOGIES

The use of new educational technologies in curriculum design offers many opportunities to better integrate content, pedagogies and assessments (see the "Research" section above). For example, when digital curriculum facilitates automated learning (such as using AI like Chatbot to give automatic feedback to students), it can provide positive feedback that avoids any teacher biases. This is especially important when teachers have unfair negative perceptions about a student. Learning analytics helps teachers manage their class, both in real time during their teaching and as a reflective tool after teaching, by supporting professional learning and suggesting solutions to ensure more student engagement.

However, such automated devices may contribute to some teachers essentially surrendering decisions regarding curriculum content, pedagogies and assessments to the digitally automated curriculum, which could create an unconscious dependence and diminish teachers' independent thinking and agency. In the longer term, automated devices in teaching could also have repercussions on the general quality of teachers and teaching, with a growing gap between teachers who enjoy the simplicity of relying on technology such as AI and those who experience strong frustrations due to a diminished sense of agency and purpose in their teaching.

It is important to ensure that teachers who are likely to rely on such tools are not deprived of the opportunity and that they are motivated to explore and think creatively to meet their students' needs, especially when those needs are diverse and complex (OECD, Forthcoming[1]). This could help to heighten teachers' sense of empowerment and, in turn, contribute to better learning experiences for students.

3. ACKNOWLEDGE THE NEED FOR INCREMENTAL CHANGES TO THE CURRICULUM WHILE MAINTAINING ASPIRATIONS FOR TRANSFORMATIONAL CHANGE

Societies around the world are changing rapidly and profoundly, and new solutions are urgently needed to achieve stronger, more inclusive and more sustainable development. This has major repercussions on what to include in the curriculum. For example, the COVID-19 global pandemic highlighted the urgency of quick adaptation for societies, particularly schools, with many countries suffering from severe consequences of school closures, especially for disadvantaged students (OECD, Forthcoming[1]). Scientific knowledge and technological progress are creating new opportunities and solutions that can enrich our lives, while at the same time fuelling disruptive waves of change in all sectors. Disruptive innovation for social change has become a discourse for educational change in some countries/jurisdictions, and these changes offer some insightful lessons.

While acknowledging that transformational changes are desirable to keep curriculum content relevant to social demands, countries/jurisdictions reported that there are significant challenges involved in "getting it right" in regard to future needs. Understanding how to integrate them in today's curriculum and securing buy-in from stakeholders in a rapid and efficient way can be very difficult (see the "Challenges and strategies" section above). These challenges often result in time lags in recognising the need to change the curriculum and in implementing the eventual changes.

Opposition to reform is likely to arise unless teachers and other key stakeholders are aligned on a vision for the future of education and are fully aware of and have thoroughly understood the reasons for such changes in curriculum. Otherwise, an overhaul of the entire curriculum may be experienced as a disruptive change, which may confuse teachers rather than encourage them to become innovators.

To counter such opposition, some countries/jurisdictions resort to less burdensome incremental changes and revising curriculum/guidelines partially and on demand, emphasising the importance of "small wins" in reform implementation. Others create space in the curriculum from the onset to accommodate new changes rapidly, for instance by setting up a dedicated subject for cross-curriculum content (see the "Challenges and strategies" section above). However, countries/jurisdictions have

also reported that incremental changes often result in a patchwork curriculum with possible time lags before achieving tangible impact. Creating space in the curriculum should also be handled with caution, so as not to provoke curriculum overload by adding more instruction time and/or creating incoherence across grades and learning areas (OECD, 2020[2]).

Maintaining a balance between a transformational whole-system change and speedier "on-demand" incremental changes would be an important way to keep moving forward with curriculum reforms in a meaningful and efficient manner, containing the time lag while gradually incorporating the competencies and skills needed for the future.

4. AVOID REFORM FATIGUE AMONG STAKEHOLDERS BY DESIGNING SYNERGIES BETWEEN CURRICULUM CHANGE AND OTHER EDUCATIONAL REFORMS

Reform fatigue, resulting from too frequent changes and adjustments to curriculum, often leads to stakeholders becoming less engaged over time, building up a resistance to change in the long run (see the "Challenges and strategies" section above). Reform fatigue may be particularly pertinent if curriculum and/or pedagogical changes are implemented before previous reforms have been embedded into practice, or if teachers are faced with contradictory reforms in a relatively short period of time.

Countries/jurisdictions reported being confronted with teachers ignoring reforms or taking them into account to a minimal extent, while maintaining and reinforcing old processes, methods and content (see the "Research" section above). However, when opting for more continuity and stability (i.e. regular cyclical curriculum reforms instead of periodical curriculum renewals), they found that curriculum was less responsive to the pace of change in society.

It takes time to rebuild trust in government-led changes and policy reforms. It is important to support the process through awareness-raising campaigns and synergies with other successful reforms or reform initiatives. Rebuilding trust is even more critical in the event of a series of reforms, especially if they have not fully succeeded.

Several countries/jurisdictions highlighted their experience of linking project-based learning to ongoing large-scale digitalisation reforms. They emphasised the need to modernise pedagogies and assessments as part of effective curriculum implementation by introducing new technologies into classrooms. Reform efforts were thus streamlined by articulating synergetic efforts into the same direction and contributing to more engagement and stakeholder buy-in (OECD, Forthcoming[3]). Others seized the opportunity to actively involve students (and at times communities) in reform processes, such as modernising learning environments (e.g. by jointly renovating common spaces in schools and building schools) to enhance the sense of agency, co-agency and involvement in the decision-making process of their immediate surroundings. This, in turn, contributed to their sense of purpose and well-being.

In short, small-scale reforms embedded into larger scale and wider-known reform efforts can contribute to speedier curriculum change, especially when efforts are made to involve stakeholders in those processes from the onset.

5. USE STRUCTURE AND DISCIPLINE WHEN MAKING CHANGES TO THE DIGITAL CURRICULUM, BEING AWARE OF CYBER SECURITY THREATS AND PERSONAL DATA ISSUES

The shift towards digital/e-curriculum appears to be one of the most efficient solutions to reduce cost and time associated with curriculum redesign, especially as it eliminates the back and forth of printing and reprinting of hard copies when changes are made. A digital curriculum substantially reduces publication costs and makes it possible to adjust curriculum content as needed in an iterative manner, as well as to give teachers greater agency in how they engage with the content.

However, one unintended consequence reported by countries/jurisdictions is that the more easily amendable format can lead to frequent alterations by curriculum developers and e-curriculum managers. These are very frustrating for teachers, as they are exposed to constant adjustments with additional, altered or superseded content, contributing to reform fatigue.

Caution is also necessary when modernising curriculum content to keep up with new societal developments. Given how quickly views and values in society can change, the curriculum can easily end up with redundant references to specific issues, events and tools. To avoid this, it is crucial for curriculum to focus on core concepts that are valued in each discipline or across disciplines, as well as on key concepts that endure over time.

A degree of discipline is, therefore, required on the part of those responsible for digital curriculum adjustments, focusing on fundamentally important adjustments rather than small-scale cosmetic changes. Otherwise, teachers, parents, and students may be frustrated by constant and confusing changes.

With a shift to digital curriculum, there is also a need to invest in stronger cybersecurity, not only tackling the technological security aspects of the hardware and software used, but building a culture of security among the end-users of the digital space (teachers, students, principals and parents).

During the COVID-19 pandemic, schools reported that they would have prioritised cyber safety more highly under normal circumstances, if they had known they would be using online learning to such a great extent. A priority issue is to guard against cyberattacks as part of daily school management, because hackers apparently regard education systems as easier targets than, for example, banking systems.

Also during the COVID-19 crisis, lack of awareness was observed about the sensitivity required with regard to protection of student data. A clear lesson learned for education management is to anticipate data protection issues with constantly evolving technologies, which allow more and more data to collected automatically and integrated into a digital platform such as through technologies which store and access information to the device (about students access data), learning analytics (about student learning processes), and digital assessments (about student performance data).

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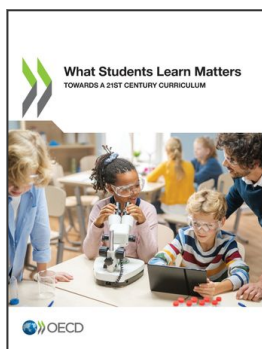
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Towards a 21st Century Curriculum

Access the complete publication at:
https://doi.org/10.1787/d86d4d9a-en