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### **Title:**

Collaborative Assessment: New Digital Assessment Approaches

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### **Abstract:**

There is growing interest in the education community around the assessment of complex cognitive skills. The Assessment and Teaching of 21st Century Skills (ATC21S) project undertook foundational research into the definitional, methodological and technical, and policy issues of such assessment, with two of the authors being active participants. The work supported OECD's PISA international assessment of schools to include an element of Collaborative Assessment in the 2015 survey. Governments around the world have shown interest in how they can implement such assessment in locally relevant curriculum contexts.

The purpose of this paper is to present the background and implementation model of a global alliance of countries and organizations that are working collaboratively to create highly relevant and localized collaborative assessment tasks, while at the same time sharing these tasks to create a global repository of collaborative assessment designs and models. This work extends the research foundation and outcomes of the ATC21S through a targeted approach to building local capacity in designing and creating effective and efficient digital collaborative assessment tasks. Linked to the methodological and technical capacity building in each country, is building experience on the implementation of such assessment tasks in classrooms by teachers, and the necessary professional development required.

Practical examples of the collaborative tasks will be demonstrated to help participants gain an understanding of the process and outcomes being used to scale access to collaborative assessment tasks for schools in participating countries.

## **Collaborative Assessment: New Digital Assessment Approaches**

### **Introduction**

This paper provide background and examples from the journey over the last five years in the research and development, learnings and implementation models for digital formative assessment tasks of 21<sup>st</sup> Century Skills. This journey started with the Assessment and Teaching of 21<sup>st</sup> Century Skills global partnership and is being extended through the work of Collaborative Assessment Alliance, another global partnership bringing together governments, agencies, non-profits, private sector and social innovation organizations in a collaborative effort to move ahead this critical agenda.

The paper includes how this effort started and has progressed to the current focus on a global alliance of local partnerships which bring together a broad range of stakeholders to work on designing, creating, testing, implementing and sharing new forms of digital assessment tasks. It provides examples of what we mean by collaborative assessment tasks and how they are informing and enabling new approaches to teaching and learning. In doing so it aims to provide greater understanding in what is one of the major developments in education assessment in recent times.

### **Background**

The Collaborative Assessment Alliance (CAA21.org, 2013) builds on the work of the global Assessment and Teaching of 21st Century Skills [ATC21S] project (<http://www.ATC21S.org>) - that ran as a multi-stakeholder partnership between Cisco, Intel, Microsoft and the University of Melbourne from 2008 to 2012. Starting with collaborative research to address the challenge that traditional assessment methods do not properly evaluate skills such as critical thinking, problem solving, creativity, communication and collaboration; ATC21S developed methods to assess these skills, approaches to align to a 21st century curricula and support towards an implementation model. The project involved six countries [Australia, Costa Rica, Finland, Netherlands, Singapore, USA], over 250 academics, educators and education leaders, and reached out to the education community broadly, with significant influence over directions for the Organization for Economic

Co-operation and Development [OECD] and International Association for the Evaluation of Educational Achievement [IEA] assessments.

Over its duration the ATC21S partnership has delivered five whitepapers, sample assessments in Collaborative Problem Solving and ICT literacy – Learning in Digital Networks - which included scoring and reporting, along with a policy guidance publication and a professional development support publication (ATC21S, n.d.).

One of the outcomes of this work was to influence OECD to include in its Programme for International Student Assessment [PISA] 2015 international assessment an element to measure student performance in the area of collaborative problem solving. This has generated much interest in governments and education communities around the world in how to go about measuring these higher order skills and how to prepare teachers to shift their practices to include them in learning design and learning delivery.

It is in this context, of a major international assessment including elements of 21<sup>st</sup> Century Skills that have not been measured at this level before, and the desire to prepare students and teachers for such an assessment, as well as the growing importance for students to develop and be able to demonstrate these skills for success in life and work, that the Collaborative Assessment Alliance was created.

### **Defining 21<sup>st</sup> Century Skills**

Prior to the ATC21S project there had been prolonged dialogue and output on how to define 21<sup>st</sup> Century Skills. And while this discussion still continues, one of the work focuses of the ATC21S project was on establishing better definitions of what was meant by 21<sup>st</sup> Century skills, particularly in the way that these skills may be organized and measured in learning contexts.

The ATC21S project delivered a logical and simple framework (Melbourne, 2010) for organizing the skills [Figure 1], which has been used broadly to aid communicating what the skills are and how they can be organized, along with learning progressions for two composite sets of skills; Collaborative Problem Solving and ICT literacy – Learning in Digital Networks.



Figure 1: Definitional Framework for 21st Century Skills

While the nomenclature 21<sup>st</sup> Century Skills may not survive as we continue to move into the 21<sup>st</sup> century, the organization and outputs of the project provide a useful frame to advance our thinking around measurement of these competencies.

### Other Outputs of the ATC21S Project

The ATC21S project delivered a number of outputs that significantly moved ahead the research agenda, knowledge base and global awareness around the teaching and assessment of 21<sup>st</sup> Century Skills. These included:

- Five peer reviewed and published whitepapers on the core tenants of the work: Definitional Issues, Methodological Issues, Technical Issues, Learning Environment Issues and Policy Issues.
- Teacher Professional Development and Policy Guidance publications
- New technology required to measure these competencies

- A set of sample assessment tasks that demonstrate how these measurements could be undertaken, which were field tested with students from the participating countries

### **Why a Collaborative Assessment Alliance?**

With the interest generated by the ATC21S partnership and the connections to OECD and IEA, it generated influence in the shape of future international assessments, such as those created by OECD [PISA] and IEA [International Computer and Information Literacy Study]. Governments were exposed to the work and wanted to know how they could implement the outcomes and learning from the ATC21S project into their systems. However ATC21S was funded as an R&D project to prove what was possible, and not as an implementation project.

This gap between the “what” – greater understanding of the competencies and how they can be measured – and the “how” – how can this be implemented within a system – created the demand for a mechanism to extend the outputs and further the learning around issues of localized development of assessment tasks that are aligned to local curriculum and learning goals; capacity building around the creation, testing and implementation of these new forms of assessment; and opportunities for research into all aspects of use and outcomes in classrooms.

Out of this need the concept was generated to create a global partnership to continue to move this agenda ahead focusing on implementation, local ecosystem enablement, capacity building and extended advocacy. Two of the original partners in ATC21; Intel and Microsoft, combined efforts with Promethean, Education Testing Service [ETS] and Cambridge University Press, along with Janison - who were the technology partner in ATC21S - and Collaborative Impact - a social innovation partnership management organization - to establish the Collaborative Assessment Alliance.

### **Why a Partnership Approach?**

Digital assessment of higher order competencies is a relatively new and growing area of interest. There remains much learning and broader understanding to be generated. It is the belief of the authors that key to the scaling and broad acceptance of this important work is the need for greater

local assessment literacy, digital assessment capacity and proven implementations. This cannot be achieved by one organization working in isolation, or even one sector. In this early stage, success will come from the creation of a healthy ecosystem with many actors working together across traditional organizational and sectorial boundaries. It is within this environment that a multi-stakeholder, cross-sectorial partnership makes sense.

The model of partnership that underpins the Collaborative Assessment Alliance is both global and local as represented by Figure 2.

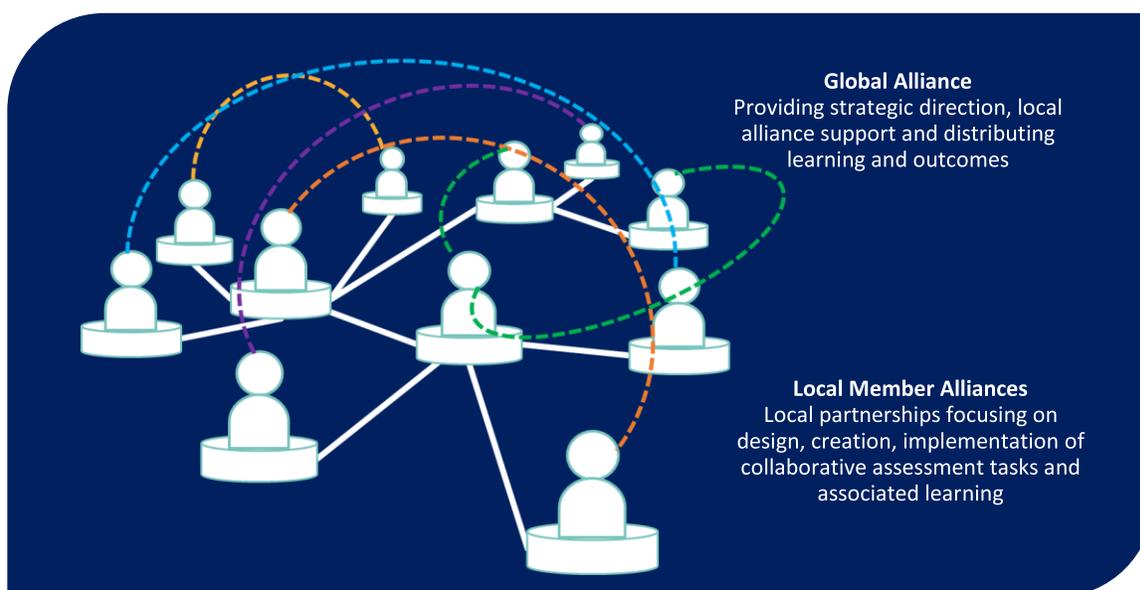


Figure 2: Collaborative Assessment Alliance Partnership Model

This model provides value for both the global alliance, local alliances and the partners in that:

- The Global Alliance distributes the knowledge and learnings from ATC21S as well as broader developments in this area, and the learnings from the work and outputs of the local alliances.
- Each Local Alliance builds understanding and capacity as they design, create and implement locally relevant collaborative assessment tasks.
- Partners agree to both contribute to the partnership resources, experience and people and in return have their own objectives supported by the value added outputs of the partnership.

## Collaborative Assessment Tasks

As mentioned, one of the key outputs of the ATC21S has been the development of a set of sample Collaborative Problem Solving and ICT literacy – Learning in Digital Networks assessment tasks. In the case of the Collaborative Problem Solving Tasks, which we will use as an example, these tasks are designed to engage two or possibly more students in working to solve a problem or challenge where each person has an incomplete set of information and tools to solve the problem. They collaborate via a Chat window built into the task to share information, support each other, problem solve and generate a solution. Individually they are not able to solve the problem, and as such the task requires collaboration.

As an example of such a task, Figure 3 shows the views of different learners in a task called Hot Chocolate. Both share the same challenge, however student A controls the recipe and has information around sales while student B is provided with information around regional preferences and profit. The chat window provides a channel for communication.

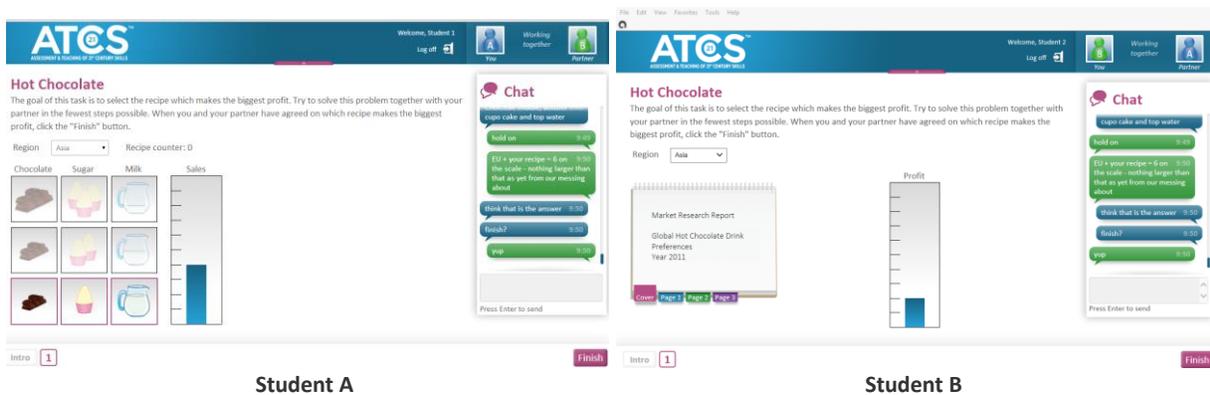


Figure 3: Example Collaborative Problem Solving Assessment Task

While students are undertaking the task, the underlying software is collecting data about their actions and approach both through mouse clicks and interactions, and through the dialogue in the chat window. Using this data the assessment task can position students on a Collaborative Problem Solving learning progression while also providing feedback on student understanding of domain specific concepts.

For teachers this reporting can help inform where each student currently is positioned on the learning progression, developmental progress, and indicating where the focus of future teaching strategies needs to be placed.

As to technology, these tasks are delivered as a Cloud Service through a browser or apps, making it easier for teachers and students to use and manage.

Building on this approach, local member alliances in the Collaborative Assessment Alliance are now taking this base to design and create digital formative assessment tasks that align with their own curriculum requirements and local contexts. They are also extending the existing thinking in the process, looking at how collaborative assessment tasks might be integrated into existing digital assessments of knowledge domains or extending the number of learners collaborating. Members are supported through a structured design, creation and testing process (CAA21.org, 2013) [Figure 4] that leads to their ability to implement.



Figure 4: Assessment Task Development Process

Each member alliance to date is including a component of research into the outcomes of the use of these assessment task which will further inform future design and creation. Because each member alliance is provided with the tools to test and implement, including at least 100,000 student assessment sessions, members are provided with an extensive data set that can enable a wide range of research and learning, within the local alliance and more broadly.

We expect the large data collection and iterative cross alliance sharing will promote innovative thinking and applications for new and better models around collaborative assessment task creation.

## Summary

In a world where it is becoming increasingly important for young people to have the complex skills required for success in life and work, the development of our collective understanding and ability to advance rapidly in the areas of measurement and teaching becomes critical. However this is not

simple and requires collaborative effort with sharing across organizations and sectors. We collectively need to be thinking about advancing on a range of issues ranging from definitional, methodological, technological, implementation and policy. At the same time there needs to be support for systems, schools, teachers and students to shift their practices to accommodate new learning and tools. This is the ambition of the Collaborative Assessment Alliance, to bring together stakeholders to move ahead rapidly and in doing so support multi-dimensional change.

Through creating a global alliance, linking local member partnerships to work collaboratively we can move ahead on this critical agenda. We hope that others share such a view and invite you to become part of this exciting and dynamic work.

The Collaborative Assessment Alliance can be found at <http://caa21.org>.

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