Demand Interoperability to Dramatically Improve the Educational Ecosystem

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 "Wow, is that really your signature?" the clerk asks as I hand over the credit card receipt. I smile and point out how it matches my card. But I know his real point is that my signature is a mess; it has been from the start. In third grade, my family moved from Springfield, Missouri, to Edgefield, South Carolina. As it happened, the Edgefield kids finished their penmanship lessons just as the Springfield kids were about to start theirs, so I was never taught cursive writing. Luckily, neat signatures aren't very important today, but my story is one example of limits students face because of poor interoperability between educational providers and within educational institutions.

To most assessment folks, interoperability probably sounds like something a chief technology officer might mention toward the end of an RFP requirements meeting. Campus leaders recognize that interoperability can reduce integration expenses, but they too often fail to appreciate its potential value to educational practices. This limited view is probably a by-product of the rapid adoption of IMS Global's Learning Tools Interoperability (LTI) specification for launching applications within a single sign-on environment (https://www.imsglobal.org/activity/learning-tools-interoperability). This successful specification has enabled hundreds of edtech applications to create a seamless experience in transitioning between tools for millions of learners. However, launching tools is only one example of the general interoperability concept, which could, if more broadly applied, dramatically improve educational practices.

Fundamentality, interoperability is about the regular exchange of data. Data exchanges can occur in many ways and for a variety of purposes, but the establishment of interoperability requires the data provider and the data consumer to agree on the specific details of the exchange. For example, what format will these data be stored in: comma-delimited files, XML, or JSON? What field names will denote a student's last name or a score on a test? Will data be sent via email, FTP, or API? To establish interoperability, a detailed set of such agreements must be codified across a community of practitioners and published via an open specification. This way, anyone wishing to exchange data will know the requirements in advance without needing to negotiate such details with each new partner. Once specifications are mature, data providers and data consumers can independently interrogate their applications using multiple tests to ensure conformance with the specification. Passing a conformance test provides a signal to others that a system can become a trusted partner in exchanging data in accordance with the details of the specification. As the number of certified products grows, the data exchanged via the specification provides more value within an interconnected ecosystem. That's why it is important for the specifications to support important and common educational practices, such as credentialing, the assessment of student learning, and curriculum articulations.

Viewpoint

Extended Transcript

Documenting a student's academic achievements in a manner that can be readily understood by others is an interoperability problem not well supported by traditional transcripts. The majority of transcripts are paper documents listing dates, courses, grades, credits, and degrees. While this information might be sufficient for transferring credits or verifying degrees, it is insufficient for most of the primary purposes of education, such as fostering metacognition, promoting mastery goals, adapting instruction, celebrating learning, sharing accomplishments, and advancing one's career. These limitations of the traditional transcript have broad impacts. Students establish short-term performance goals around course grades, the only information that persists on transcripts. Faculty begrudgingly engage in curricular and assessment initiatives, knowing their efforts won't be officially recorded for students nor will they be professionally beneficial. Employers make important hiring decisions without bothering to review transcripts containing irrelevant information. At a time when educational credentials have never been more important to an individual's success and society's prosperity, the interoperability problems of the traditional transcript must be redressed.

Over the last three years, several educational providers, edtech companies, and organizations have partnered to modernize the transcript via IMS Global's Extended Transcript (eT) specification. The eT defines how to digitally record a learner's achievements at an institution. It supports recording achievements for the following six entities: degree, certificate, course, co-curricular, competency, and assessment. An extended transcript can record complex curricular structures via common hierarchy relationships such as parent, child, or peer, along with more sophisticated associations. Skill levels such as those established by the Lumina Foundations' Credentials Framework (http://connectingcredentials.org/framework/) are also supported. The eT can also be flexibly extended as needed by the institution. Combined, these records, entities, and associations permit institutions to provide students with a semantically-meaningful record of their specific achievements at an institution. Several institutions are in the process of testing the extended transcript with their students and initial results have been positive (https://www.imsglobal.org/eT). The extended transcript specification enables credentials to be valued for the information they communicate about an individual's specific achievements, thereby empowering students to advocate for their career goals using evidence that hiring managers can find, understand, and trust.

Competencies & Academic Standards Exchange

Administrators of competency-based educational programs appreciate the importance of interoperability because they have long struggled without it. Surveys have confirmed that simple interoperability solutions would help these programs with several common tasks, such as managing competency statements and students' associated assessment results (http://er.educause.edu/articles/2016/2/an-evolving-technology-landscape-for-competency-based-education). Interoperability across competency programs has seemed impossible given these programs' apparent differences in terminology, processes, and roles. However, closer examination of these differences reveals several commonalities. For example, some programs use the term "competency" to reference students' terminal program accomplishments, while others use the term "outcome," but all programs have a small set of statements for this purpose. Programs also differ in how competencies relate to units, assessments, courses, and programs, but a small set of associations is sufficient to

communicate these structures. Such insights establish a basis for defining a specification that can be both flexible to a program's specific design and meaningful across multiple use cases.

Based on these researched interoperability needs, IMS Global has published the Competencies & Academic Standards Exchange (CASE) specification (https://www.imsglobal.org/case) to support the exchange of competencies and rubrics. CASE defines a competency statement as an item that can have an association to a document. These three objects, item, document, and association, enable the exchange of educationally-meaningful frameworks for a variety of important use cases, such as managing a digital curriculum with relations to external frameworks or finding instructional materials supporting particular competencies. CASE also enables institutions to publish a credential's competency framework to the web, such as via Credential Engine's Credential Registry (https://www.credentialengine.org/credentialregistry). A CASE item can also be associated with a rubric via a criterion. This additional feature of CASE enables assessment tools to be configured by a curricular management tool to support multiple outcomes-based reporting usecases, such as program reviews, accreditation reports, and student dashboards. As such, faculty's assessment work can move beyond compliance to become a process for creating interpretable evidence of a learner's competency demonstration.

Reflections for Action

Sometimes, I wonder how my signature would look if these specifications were in place before my family moved. Could I have noticed a penmanship gap by reviewing visual representations of my eT? Could my parents have been alerted to potential educational gaps before we moved by comparing schools' published CASE-curricula? Could my Springfield teachers have anticipated my penmanship gap by comparing their CASE curricular plans? Could my Edgefield teachers have defined a personalized instructional plan by comparing my eT with CASE-tagged resources? These alternate universe questions spur me to act; fortunately, I've found that assessment professionals can be instrumental to advancing interoperability in several important ways.

Assessment professionals can help students, faculty, and employers promote quality practices by demanding interoperability, even over cool product features and slick user interfaces. Adoption is the primary challenge for any specification. If only a few edtech products invest in conformance testing, the intended community benefits will never be realized no matter the quality or properties of the specification. That is why it is important for all of us to learn about interoperability, existing specifications, and conforming edtech products (https://www.imsglobal.org/cc/statuschart.cfm). By doing so, we can help promote quality educational practices that connect curricular, instructional, and assessment practices to students' credentials.

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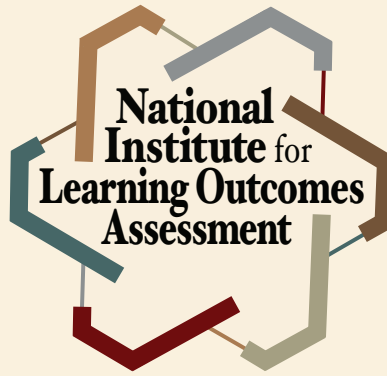
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