MAPPING DIGITAL TRANSFORMATION

Identifying and Understanding Pragmatic Trends in the Application of Technology to Improve Learning Impact

LEARNING IMPACT REPORT | 2019

Sponsored by

AEFIS
Assessment Improved

D2L
DESIRE2LEARN

IMS GLOBAL®
Learning Consortium
Better Learning From Better Learning Technology®

WWW.IMSGLOBAL.ORG | @LEARNINGIMPACT

Executive Summary

Accelerating EdTech Adoption and Impact

Educational technology continues to enhance what individuals learn in school, what they learn about themselves, and how they engage in the world around them. IMS Global Learning Consortium, a non-profit collaborative led by over 550 member organizations, focuses on enabling edtech interoperability and collaborative leadership—elements that are instrumental to advancing education and achievement. IMS created the Learning Impact Program to recognize and track innovative edtech uses that are providing real-world solutions to effective digital transformation in education that will enable better teaching and learning. Its pragmatic approach—by focusing on actual and impactful edtech applications—helps K-12 schools, districts, state agencies, higher education institutions, and other entities understand the role of technology in fulfilling their teaching and learning objectives. Program resources include:

Learning Impact Trend Categories (Fig. 1)

A framework of forward-moving technology trends to assess and analyze the edtech landscape. Trend categories identify and track leading-edge concepts such as gaming and simulation, mobile learning resources, educational pathways and learning maps, and learning platform customization. In some cases, these trends were identified several years before they become mainstream. IMS revises the framework when needed to reflect the complex and evolving edtech landscape. The 16 current Learning Impact Trends are grouped into three main categories:

Advancing Educational Insight, Attainment, and Planning

Advancing Teaching and Learning Technology

Advancing Learning Environment Infrastructure

Learning Impact Awards

IMS Global Learning Consortium's annual award competition showcases innovative, high-impact solutions for K-12, higher education, and lifelong learning. Each entry maps to the Learning Impact Trends. An expert panel evaluates the entries for evidence of impact on:

Personalized Learning

Institutional Performance

Advancing the Digital Learning Ecosystem

Regional winners and selected finalists advance to the final competition round, held at IMS Global's Learning Impact Leadership Institute—where final voting names platinum, gold, silver, and bronze medalists.

The nomination period for the 2020 Learning Impact Awards begins on 15 January and ends on 28 February 2020.

Medal winners are announced at the Learning Impact Leadership Institute, 18-21 May 2020, in Denver, Colorado, United States.

Learning Impact Report

Thirty-two groundbreaking edtech projects competed for the 2019 IMS Learning Impact Awards. This report is both a strategic and pragmatic resource, mapping the award finalists to the state of educational technology in its analysis, as well as summarizing the finalists' entries to help others replicate similar solutions.

Learning Impact Trend Framework

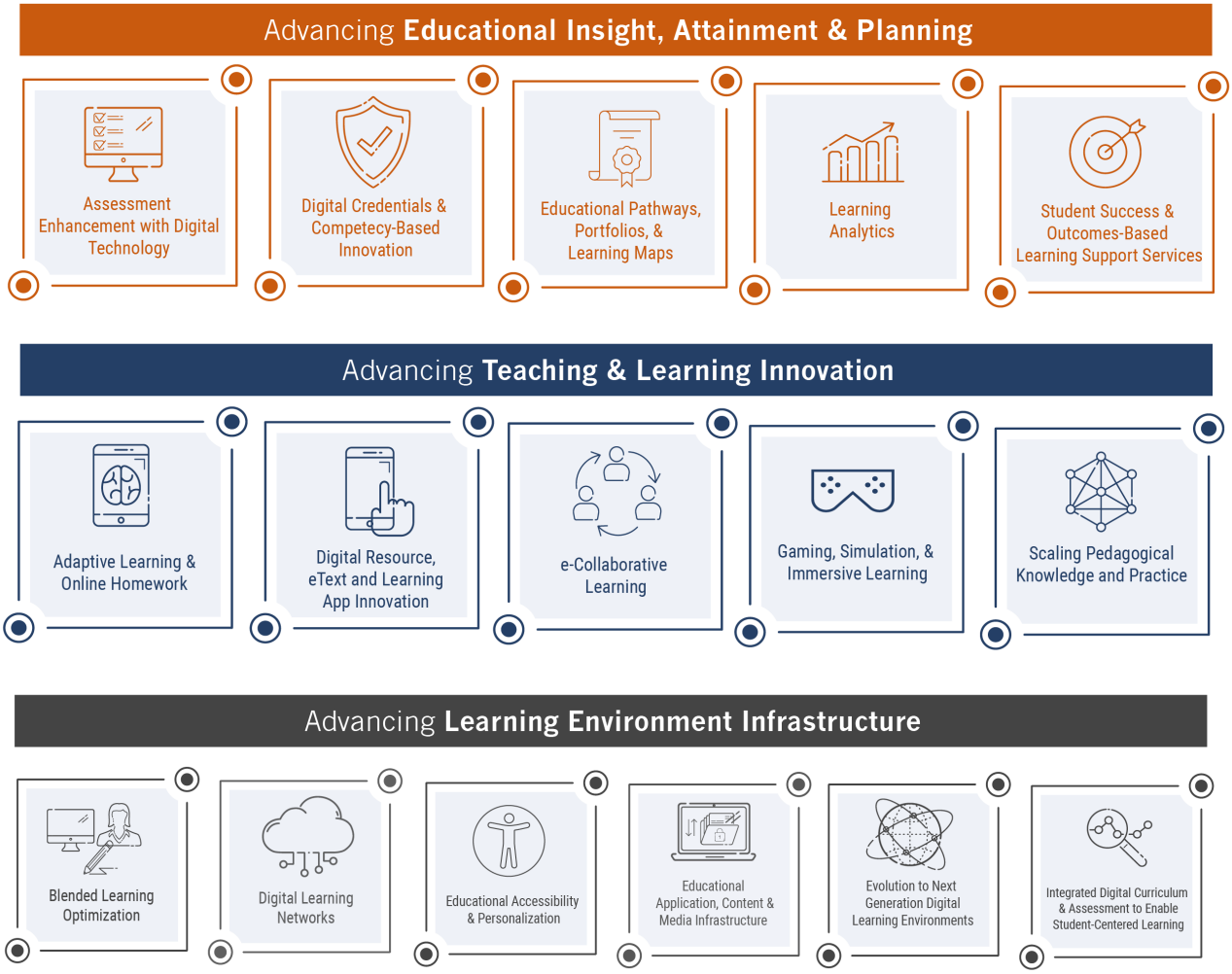


FIGURE 1. LEARNING IMPACT TREND FRAMEWORK

Evolving to NextGen EdTech: Accessible, Equitable, Engaging, and Personalized Learning

The first Learning Impact Report (published in 2007) presented a vision of educational transformation comprised of foundational edtech components like:

- The rise of the learning platform
- Continued dominance of instructor-led and credential-based learning
- Custom and supplemental content
- Open-source resources
- Integrated access to teaching and learning resources
- Usable, efficient, and effective digital/print content collections
- Self-directed learning programs with instructors in the loop
- Collaborative learning
- Defining and implementing accountability and dashboard metrics

Over the years, IMS Global's Learning Impact Program has tracked this vision's realization. However, perhaps the most critical development is that ***edtech is now an essential—not an elective—component of today's learning experience***. Emerging technologies, open standards, replicable practices and projects, and user understanding make it easier and more cost-effective to implement an edtech foundation for K-12, higher education, and lifelong learning environments—sectors where digital teaching and learning is rapidly becoming the norm.

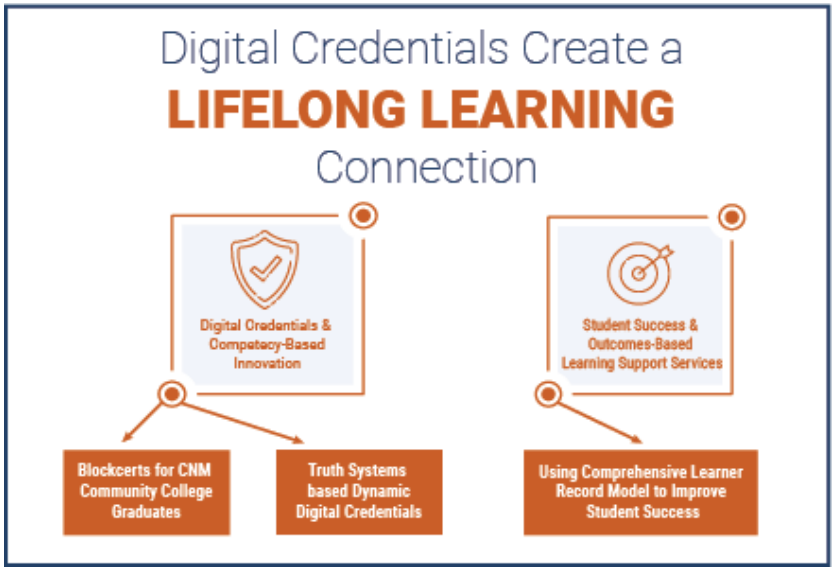
Perhaps it is time to consider the possibilities with the next generation of edtech—the big ideas—that synthesize and energize these foundational pieces to provide authentic, accessible, and customizable learning experiences:

- In the K-12 or college classroom and throughout a student's life
- With multiple applications, platforms, and experiences in a connected, seamless environment
- Using data from these resources to access performance and to create a customized learning experience based upon the student's specific needs
- To engage the student in the classroom and with the world

Let's examine these trends a little bit closer and discover examples of how 2019 Learning Impact Awards medalists and finalists point the way to the future of education.

Digital Credentials Create a Lifelong Learning Connection

Digital credentials are rapidly gaining traction among schools, higher education institutions, vendors, and employers that see the potential for beneficial, leverage-able solutions. The ability to combine digital badges with a person's comprehensive learner record heightens this potential—as presented by finalist AEFIS and University of the Science's Comprehensive Learning Record Model. There is a practicality to digital credentials that all parties grasp firmly—moving beyond the traditional student transcript and creating a digital record that can follow a learner from K-12 to career. The goal is to recognize not only performance but learner experiences and achievements beyond the classroom that shape the full circle of an individual's lifelong journey. Having all this information in a single student record is extremely powerful. Furthermore, technology is driving digital credential development. For example, 2019 Learning Impact Awards finalists, Learning Machine and Central New Mexico Community College and Phoxel Technologies and E&ICT Academy, National Institute of Technology, both utilize cutting-edge blockchain technology, to create secure and accessible digital credentials for students to share with employers.



An Expanding, Seamless Learning Ecosystem Ties Everything Together

Interconnectivity continues to gain importance as K-12 schools and districts, as well as colleges and universities, add more systems, platforms, and tools into their learning environments to enrich the student experiences. For example, 2019 gold medalist Public Consulting Group and Broward County Public Schools integrated its LMS and student accommodation information—housed in multiple systems—into a single portal, enabling teachers to see each student's accommodation information at the bottom of the LMS pages, resulting in better-prepared teachers and lessons.

consistent, reliable, and robust data access from these off-premises resources. Standard-based APIs not only enable educational entities to tie together their profusion of resources but provide vendors with a consistent, standards-based middle-layer to build integrations to their solutions.

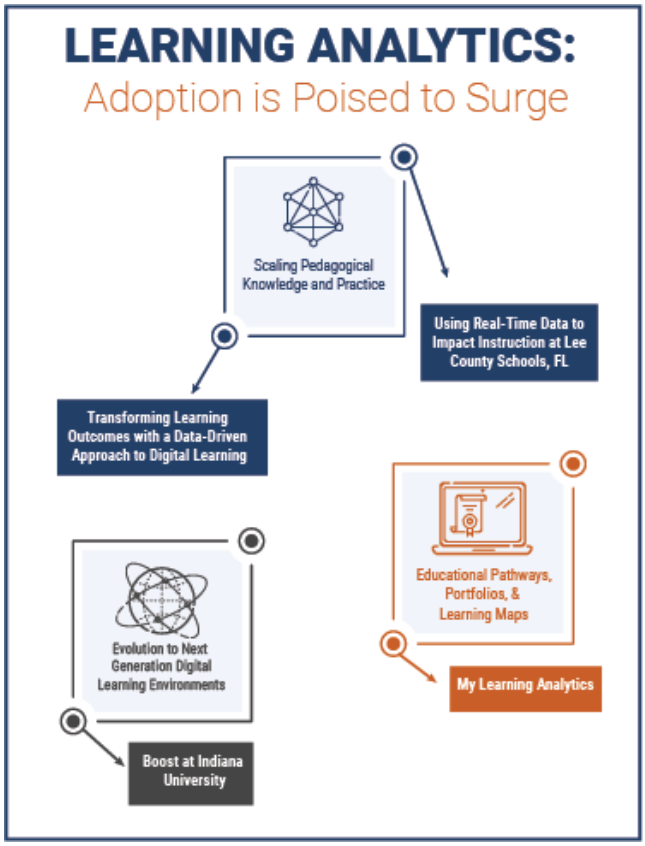
The integrated learning ecosystem continues to expand with contributions from various stakeholders. For example, 2019 Learning Impact Awards silver medalist LearningMate Solutions, Inc. and South Carolina Department of Education developed a state educational standards authoring and communications platform to quickly notify and provide districts with learning resources that are aligned to newly developed standards.

Open standards like IMS Global's Learning Tools Interoperability® (LTI®), and up-and-coming higher education Edu-API work, continue to drive and facilitate the development of these seamlessly integrated learning ecosystems. The next generation Edu-API is especially important as it is designed to accommodate emerging educational models like competency-based learning and programmed-based enrollment and to envelope the whole canopy of ERP-type data like CRM, admission and recruiting, and student information system (SIS) data. As cloud systems, services, and platforms continue to gain popularity, there will be an increasing need for

Vendors and publishers can integrate into the learning ecosystem, too, as shown by itslearning and Bartholomew Consolidated School Corporation, who created a single access point for the itslearning library of digital curriculum resources used by Bartholomew schools.

Learning Analytics Adoption is Poised to Surge

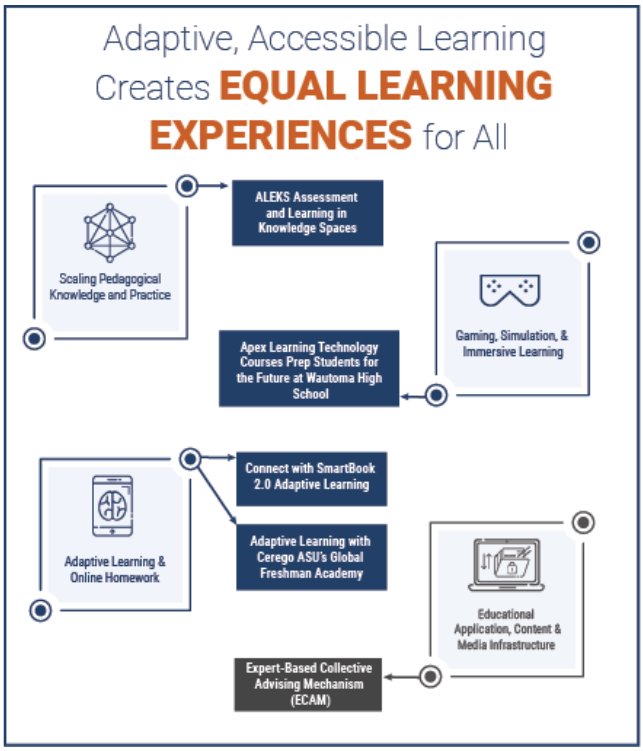
Several factors are converging to drive adoption and make analytics more attainable in higher ed—and even in K-12: 1) Pioneering higher education institutions are developing replicable practices for multi-system data gathering, transmission, and analysis; 2) Vendor cloud-based services—most notably storage—make it easier and less costly to implement analytics; 3) Standards, like IMS Global's Caliper Analytics® bring these systems together in a more seamless way.



These cutting-edge 2019 Learning Impact Awards medal winners demonstrate analytics possibilities. Platinum medalist Lee County developed an analytics tool that aggregated data from multiple platforms and tools into a single dashboard so teachers can tailor their instruction and class experiences on-the-fly, based upon real-time student performance data. Platinum medalist Indiana University developed Boost, a mobile app that deploys automated, data-driven assignment reminders, resources, and encouragement to help students stay engaged in their courses. And gold medalist University of Michigan, developed a student-facing analytics tool, My Learning Analytics, to help them track and compare their course performance against their classmates.

Adaptive, Accessible Learning Creates Equal Learning Experiences for All

Adaptive, accessible learning continues to gain traction in both higher education and K-12 spaces, supporting today's evolving learning environment. The increasing use of digital resources and online learning—not just in terms of distance learning—but also in courses, is fueling the ability to leverage adaptive, accessible learning. For example, teaching modalities and pedagogies must change to reflect an increasing diverse student population. Learning Impact Award entries like 2019 bronze medalist McGraw-Hill and Arizona State University's ALEKS adaptive, dynamic math and science learning path matches course content to the individual student's knowledge readiness to tackle the topic.

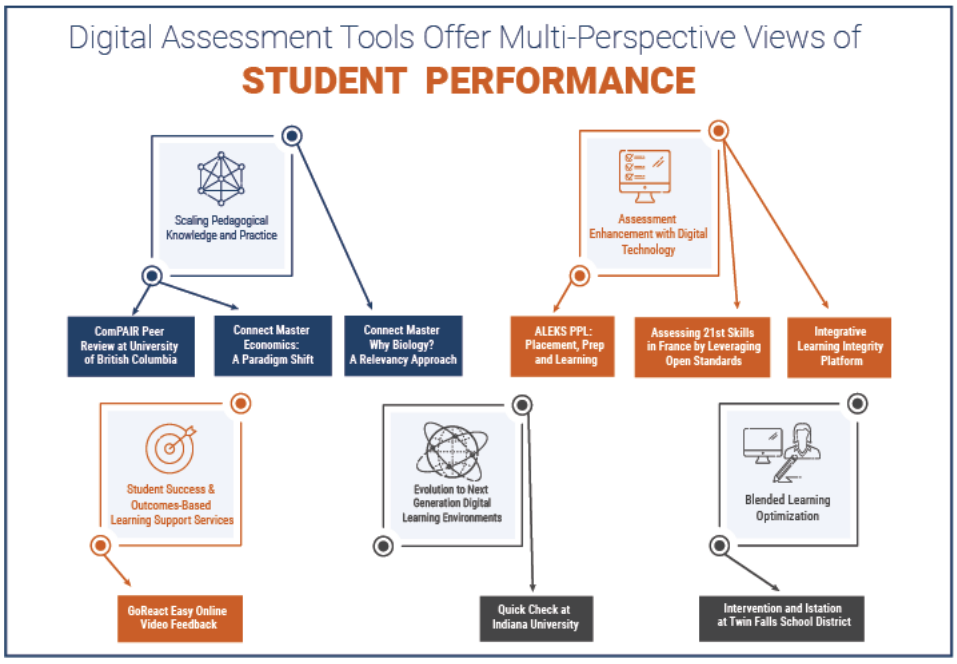


Students' situations—location, long-distance commutes, parental custody arrangements, and/or working while attending college—impact their ability to attend face-to-face classes and access school resources. A 2019 Learning Impact Award bronze medalist Advanced Innovation Center for Future Education of Beijing Normal University and Beijing Municipal Commission of Education connects Beijing public middle and high school teachers and resources with rural Chinese students. Apex Learning and Wautoma High School bring industry-standard coding and gaming design training to a rural Wisconsin school district. McGraw-Hill's Connect with SmartBook 2.0 provides both adaptive content in an accessible, smartphone app.

Digital Assessment Tools Offer Multi-Perspective Views of Student Performance

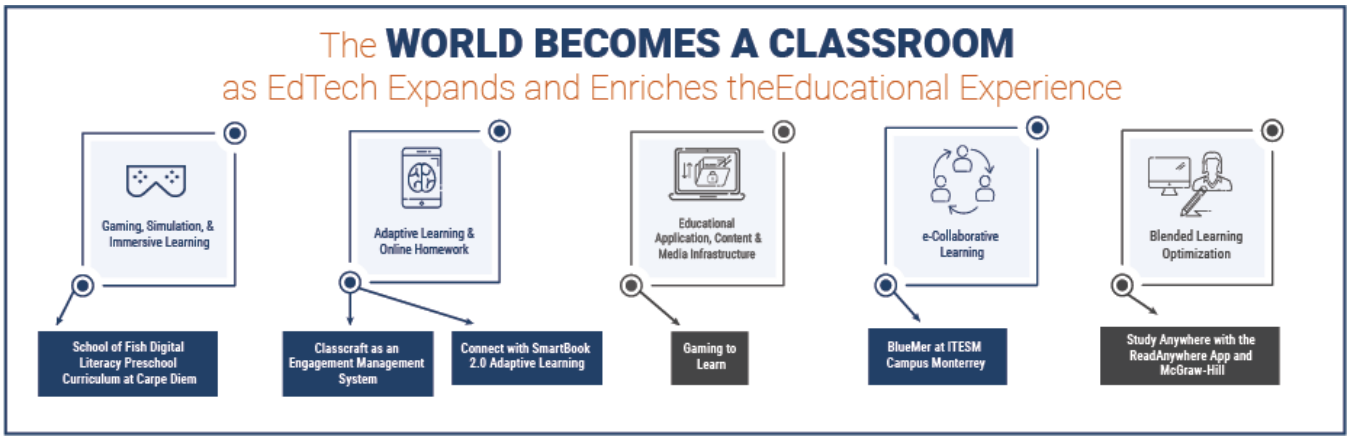
Digital assessment continues to expand beyond standard testing to truly capture a student's entire academic performance. For example, 2019 recipient of a silver Learning Impact Award University of British Columbia, developed ComPAIR, a peer comparison-based assessment tool.

Open Assessment Technologies and DEPP-Ministère de l'Éducation Nationale doesn't just report a student's online science or math test answer but tracks the student's every step in solving the problem. GoReact is a video assessment tool shown to improve student performance when incorporated into pedagogy. Digital formative assessment tools are also emerging, exemplified by Indiana University's Quick Check formative assessment platform, Istation's K-5 reading and math formative assessments, and even publishers, like McGraw-Hill, are building formative assessment into their e-text platforms, as demonstrated in their Connect Master Economics and Why Biology? entries.



The World Becomes a Classroom as EdTech Expands and Enriches the Educational Experience

Innovative learning technology continues to create richer and authentic learning environments like teaching foundational coding and computation skills to preschoolers (demonstrated by finalists Sony's KOOV and JULES Corporation and Carpe Diem), social and emotional learning skills (Classcraft), and math concepts through gamification (KATY Independent School District). Technology advances like 5G cellular and high-speed networks, continue to help video, gamification, and virtual reality-based tools become a regular part of a student's learning experience.



Summary of the 2019 Learning Impact Awards Program Finalists

Thirty-two groundbreaking edtech projects advanced to the final round of competition for the 2019 IMS Learning Impact Awards. Medal winners were selected by a panel of experts—that observe and evaluate presentations of each project—and votes from the edtech community-at-large. Winners were announced at the Learning Impact Leadership Institute in May 2019.

This section summarizes the 32 projects that advanced to the final stage of the 2019 Learning Impact Awards competition. The projects are organized in tables grouped by their Learning Impact Trend Category:

- **Advancing Educational Insight, Attainment, and Planning**
- **Advancing Teaching and Learning Technology**
- **Advancing Learning Environment**

Projects are sorted within each table alphabetically by Learning Impact trend classification so readers can easily identify solutions by a particular interest or teaching and learning needs. Each project name is linked to its Learning Impact Award entry video. The project detail includes a brief description of the solution and its learning impact; its learning objective; and the potential user(s): K-12, higher education (HED), and/or lifelong learner (LL).

Detailed project profiles for the eight 2019 medal winners can be found at www.imsglobal.org/lia/2019/profiles.

Learning Impact Category: **Advancing Educational Insight, Attainment, and Planning**

Assessment Enhancement with Digital Technology

Project	**Assessing 21st Skills in France by Leveraging Open Standards—Open Assessment Technologies and DEPP-Ministère de l'Éducation Nationale**	View Project Video
User	K-12 HED	
Objective	Digital Assessment: math and science problem solving	
Learning Impact	Deeper insight into students' online test problem solving strategies provide more digital assessment possibilities. In Spring 2017, the France DEPP administered 12 science PCIs to 10,000 students and 25 math PCIs to 11,000 students.	
Solution	Math and science problem solving skills digital assessment is problematic because traditional assessments are typically scored based on a student's final answer. Digital assessments that include Portable Custom Interactions (PCI) enable the instructor to see a student's entire problem-solving activity by recording and encoding the student's interactions in submitted data—as for example, student's work start and stop times, mouse movements, use of different onscreen tools, and a screenshot of the last actions. France's Direction de l'évaluation, de la prospective et de la performance [DEPP]) built their PCIs on the TAO open source digital assessment platform and continues to scale their use in science and math digital assessments.	

Project	**Integrative Learning Integrity Platform—Proctorio and California Virtual Campus**	View Project Video
User	HED LL	
Objective	Remote Proctoring: online tests	
Learning Impact	Ability to scale online program test monitoring without burden of high costs. Proctorio remotely monitors an average of 10,000+ exams per day for it 300+ partners in 201 countries.	
Solution	Proctorio's learning integrity platform prevents breaches in academic integrity and validates student identities while taking exams. Exam administrators set a customized, on-demand proctoring specific to their assessment needs including a lockdown browser, video and audio recording, and/or ID verification features. Once the student completes the proctored exam, a detailed integrity report is securely and instantaneously delivered to the instructor. Proctorio's cost structure—fixed price per student—enables instructors to issue an unlimited number of exams in their courses.	

Assessment Enhancement with Digital Technology

Project	**ALEKS PPL: Placement, Prep and Learning—ALEKS and University of Illinois**	View Project Video
User	HED	
Objective	Math course placement	
Learning Impact	Approximately 615,000 students in 350+ institutions use ALEKS Placement, Preparation and Learning (PPL) today. Students who spend an average of 6 hours in ALEKS PPL modules often place one math course higher.	
Solution	ALEKS PPL places students in appropriate math courses. It uses a combination of adaptive assessment and personalized learning to measure a student's mathematical knowledge and productive persistence, and then creates a personalized learning module for the student to review and refresh mathematical concepts. The placement assessment places students from basic math through calculus one. In class, students come prepared to learn the class's topics.	

Digital Credentials and Competency-Based Innovation

Project	**Blockcerts for CNM Community College Graduates—Learning Machine and Central New Mexico Community College**	View Project Video
User	HED LL	
Objective	Digital credentialing	
Learning Impact	Students and workers manage and communicate measurable skills along their education path. Central New Mexico Community College incorporates Blockcerts and Open Badges into a digital Comprehensive Student Record; enabling graduates to use Blockcerts to secure jobs.	
Solution	Blockcerts leverage blockchain technology for digital verification of diplomas, transcripts, or other credentials. It's an MIT-developed open source license that enables anyone to issue, receive, and verify Blockcerts. The solution includes a Universal Verifier to verify any issued Blockcert. Rather than using a simple image format, like badges, Blockcerts are JSON files that could potentially embody any type of data and generate any type of display. The records are cryptographically signed by the issuer, include recipient keys, and are registered on a blockchain for later verification. Students or workers can manage their own credentials; able to store, access, and verify any Blockcert.	

Digital Credentials and Competency-Based Innovation

Project	**Truth Systems Based Dynamic Digital Credentials—Phoxel Technologies and E&ICT Academy, National Institute of Technology**	View Project Video
User	HED LL	
Objective	Digital credentialing	
Learning Impact	Provide secure, portable digital credentials, especially aimed at students and workers in rural areas and developing countries.	
Solution	Phoxel's TruthSystems platform is built on blockchain technologies to provide secure digital credentials. The TruthSystem platform's Dynamic Digital Credentials issue Open Badges and its Distributed Ledger Technology saves the credential data on multiple nodes, but only upon consent by the issuer, assessor, signatory, and the student or worker. Every party in the ecosystem is entitled to keep a copy of the data (i.e. node). Phoxel's high throughput systems are designed to process a huge volume of digital credentials.	

Educational Pathways, Portfolios, and Learning Maps

Project	**Digital Learning Ecosystem to Support Universal Design for Learning—itslearning and Bartholomew Consolidated School Corporation**	View Project Video
User	K-12	
Objective	UDL-supported learning management system	
Learning Impact	24/7 student access to a single learning environment of diverse digital resources that supports UDL's student-centric instructional framework.	
Solution	itsLearning's LMS supports the Universal Design for Learning (UDL) instructional framework's focus on K-12 students' equal access to learning and achievement as well as students' choice in how they learn and show their understanding. It's a single learning environment that provides variety of tools to support learners in all pathways—as for example discussion tools for students to discuss project with each other and their teacher as well as audio and visual means to demonstrate understanding and learning. The single learning environment provides a one access point to the itsLearning library of digital curriculum resources, which are aligned with academic standards. Students can organize their work in their collaborative groups.	

Student Success and Outcomes-Based Learning Support Services

Project	**GoReact Easy Online Video Feedback—GoReact**	View Project Video
User	HED LL	
Objective	Video formative feedback	
Learning Impact	Research shows measurable student performance improvement when incorporating GoReact into pedagogy. Over 500 universities use GoReact and 4 million student videos have been submitted for instructor feedback.	
Solution	Viewing oneself via video combined with teacher/mentor feedback accelerates skill development, especially for online courses in language training, communication, teaching, and others. GoReact is a formative feedback tool combines video and time-coded feedback into an easy-to-use platform. It's web-based and hardware agnostic so teachers and students can record videos on smartphones or other devices. GoReact supports text, audio, or video feedback for viewing live, later, or remotely. All feedback is time coded to the video's exact moment. Other features include customizable learning rubrics and student performance reporting and analytics. It integrates seamlessly into major LMS and features LMS grade passback.	

Project	**Using Comprehensive Learner Record Model to Improve Student Success—AEFIS and University of the Sciences**	View Project Video
User	HED	
Objective	Assessment management platform	
Learning Impact	Operational assessment in conjunction with students and faculty system access enhanced University of the Sciences Philadelphia College of Pharmacy students' success: More dean's list earnings and zero program probations for first-year pharmacy students.	
Solution	AEFIS's scalable end-to-end assessment management platform operationalizes assessment, creating meaningful evaluation in a transparent, shared environment. At the system's core is the Comprehensive Learner Record (CLR) that displays a students' entire learning journey including courses, competencies, employability skills, experiential learning, badges, certificates and licenses. Instructors can readily identify students who are at risk. Students see real time progress on courses, receive informative instructor feedback and mentor coaching, review evidence of mastery aligned to the specific outcomes, and can export their CLRs to social media, employers and educators. The result is not just a grade, but identification of a student's growth, improvement and strengths.	

Learning Impact Category: **Advancing Teaching and Learning Innovation**

Adaptive Learning & Online Homework

Project	**Adaptive Learning with Cerego at Arizona State University's (ASU) Global Freshman Academy (GFA)—Cerego and ASU**	View Project Video
User	HED	
Objective	Adaptive learning online courses	
Learning Impact	In ASU's Spring 2019 GFA Health and Wellness course, the 436 students who completed all Cerego sets earned a 12% higher average course grade. ASU integrated Cerego into 10 courses, and over 23,000 ASU students have used Cerego since 2015.	
Solution	Cerego provides a customizable adaptive learning platform based on neuroscience and cognitive science principles. Its proprietary learning engine knows what to teach, when to test, and how to measure progress. Instructors adapt their own or Cerago's content to create a course. Students access the course via a web browser or mobile app and demonstrate content mastery—either through a web browser, a mobile application or digital assistant. Cerego's proprietary algorithms continually measure and predict performance, on an individual level, unique to each item being learned. By continually assessing what learners know and predicting how long they'll recall, Cerego can time their next learning session.	

Project	**My Learning Analytics—University of Michigan**	View Project Video
User	HED	
Objective	Student course performance self-regulation	
Learning Impact	My Learning Analytics (MyLA) pilot findings include: 88% of student participants agreed it changed the way they plan their course activity; 86% agreed it changed their sense of control over their course performance. The MyLA pilot continues to expand at UM and other institutions including Indiana University, The University of Iowa, and The University of British Columbia.	
Solution	University of Michigan's (UM) My Learning Analytics (MyLA) pilot explores the impact of providing students with visualizations and insights for self-regulated learning and course performance in relation to their peers. The pilot's dashboard provided three views of the students' own data showing files accessed, assignment activity, and grade distribution. It leveraged the Unizin Data Platform, which ingests data from the student information system, the Canvas learning management system, and IMS Global Caliper event streams from 7 different learning tools.	

Adaptive Learning & Online Homework

Project	**Classcraft as an Engagement Management System (EMS)—Classcraft**	View Project Video
User	K-12	
Objective	Social and emotional learning (SEL) skills	
Learning Impact	Classcraft rewires classroom social dynamics by making students more accountable for their behavior and academic performance; which encourages positive experiences like helping each other. Over 5 million students and teachers in 165 countries use Classcraft.	
Solution	Classcraft blends physical and virtual learning in a game that students play together throughout the school year. Working in teams, students create an avatar which acts as a virtual extension of their school progress. They earn game points for their avatar by exhibiting positive class behavior; used to progress to the game's next level and to unlock academic and personal privileges. Teachers customize the platform's different gamified features. Features include a classroom management component, formative assessment quizzes, and a personalized learning tool that turns existing teachers' lessons into game quests. Proprietary analytics track changes in SEL, school climate, and student engagement.	

Project	**Connect with SmartBook 2.0 Adaptive Learning—McGraw-Hill and Bunker Hill Community College**	View Project Video
User	HED	
Objective	Adaptive learning and reading tool	
Learning Impact	Students learn key concepts outside of class, enabling instructors to teach higher-level concepts during class.	
Solution	Connect is an adaptive learning and homework platform supported by the SmartBook 2 reading and assignment tool for McGraw-Hill and/or the instructor's content. Its meta cognitive theory determines what students know—as for example, self-selected confidence levels and number of question attempts—and adjusts their learning path accordingly. Connect with SmartBook 2's reports and granular assignment creation allows instructors to focus on the specific learning objectives. Students upload SmartBook 2 assignments on their smartphones.	

Project	**KOOV for Enterprise—Sony** *IMS Japan Society Regional Competition Finalist*	View Project Video
User	K-12	
Objective	Coding and robotics skills	
Learning Impact	KOOV builds children's STEM skills with robotics and coding; preparing them for school and jobs. Even teachers with no coding experience can teach KOOV courses.	
Solution	KOOV is a comprehensive educational solution to teach children about robotics, coding, and design. Using colorful blocks and sensors, children build robots from robot 'recipes'; courses teach students how to build and code their robots. Children can download code and the share their work with other children globally on KOOV's online community. For example, when a child uses an LED for the first time; the course explains what an LED is and how it is used in real life; and then learn how to use code to make it operational. At the end of the course, children understand the individual parts, how they work, and how to combine them into a functioning unit.	

E-Collaborative Learning

Project	**BlueMer at ITESM Campus Monterrey—Tecnológico de Monterrey**	View Project Video
User	HED	
Objective	Online student support community	
Learning Impact	Students gain motivation, self-discipline, sense of belonging and collaboration by working together on mutual goals. BlueMer is expected to reach 91,200 students at the 26 Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM) campuses in Mexico.	
Solution	BlueMer is a prototype digital community platform, offering a collaborative and interactive environment that enables students with similar goals and interests to work together despite geographical or logistical limitations. Available categories include cultural, sports, artistic, and student groups. A student sets new goal, shares it in BlueMer, connects and works with other students, gains motivation; and receives recognition for their achieved goals. BlueMer offers information about the different resources that are available to students to support them in achieving their challenge, such as: physical spaces, available mentors or other digital applications.	

Gaming, Simulation, and Immersive Learning

Project	**Apex Learning Technology Courses Prep Students for the Future at Wautoma High School—Apex Learning and**	View Project Video
User	K-12	
Objective	Coding, gaming, and animation skills	
Learning Impact	Apex provides rural students hands-on access to technology courses, enabling them to develop 21st century skills for college and careers.	
Solution	Small, rural school districts often lack the teacher skills and resources to offer industry-standard technology courses. Apex Learning gives districts the opportunity to offer technology courses even if they lack teachers with expertise in industry standards tools. Its digital curriculum offers project-based technology courses, including coding, gaming, and animation. Students use industry-standard tools to complete projects such as developing an iOS or Android app, creating a 3D video game, or designing a fashion collection. The technology courses include support from online experts.	

Project	**School of Fish Digital Literacy Preschool Curriculum at Carpe Diem—JULES Corporation and Carpe Diem**	View Project Video
User	K-12	
Objective	Computation thinking skills	
Learning Impact	Children develop digital intelligence, proper online etiquette (“Netiquette”), online safety knowledge, and financial literacy. The School of Fish program continues to expand through Asia.	
Solution	Jules School of Fish teaches computational thinking skills and digital literacy to kindergarten students and children in afterschool programs. Educators certify through the Jules Computational Thinking Training Program. The curriculum prepares children for primary school as they learn to problem solve by computational thinking—which is the foundation of coding. It uses gamification, mobile apps to simplify learning of complex computational thinking concepts; and includes a variety of online and offline activities using tablets, Legos, origami, and ‘Buddy booklet’ activities. Its proprietary analytics and dashboards enable teachers and parents to monitor children’s progress.	

Scaling Pedagogical Knowledge and Practice

Project	**Academic Competency Management Tool (ACMT): Powering & Connecting State Standards—LearningMate Solutions, Inc. and South Carolina Department of Education**  View Project Video
User	K-12
Objective	State education standards authoring and communication platform
Learning Impact	ACMT streamlined authoring and communications processes, enabling faster, more accurate state standards creation and districts' subsequent standard adoption.
Solution	LearningMate's ACMT is a digital state standard authoring and communications platform to help states write, publish, and communicate standards updates to school districts, curriculum providers, and teachers; and to ensure lesson plans and teaching material are synced to the most recent standard. At the state level, ACMT streamlines the entire standards authoring workflow from end-to-end among stakeholders. Districts use ACMT to connect directly with state education departments to receive an automatic notification when a standard is changed or updated. A local ACMT instance provides a district with a platform to digitally connect customized lessons plans and guides to specific standards so teachers have quick access to up-to-date curriculum examples.

Project	**ALEKS Assessment and Learning in Knowledge Spaces—McGraw-Hill and Arizona State University**  View Project Video
User	HED
Objective	Personalized learning: math and chemistry
Learning Impact	ALEKS increased pass rates, improved student retention, and accelerated learning for an ASU algebra class. Pass rates increased from 62% in Fall 2015 to 74% in 2017.
Solution	Students' wide range of prerequisite gap can stymie math and chemistry retention rates. Instructors spend reviewing old material or focusing on developing procedural and computational skills. ALEKS is a mastery-based learning platform for math and chemistry that identifies what students already know, what they don't, and what they're ready to learn next—creating a personalized and dynamic path to meet their unique goals. Student won't waste time on topics they already understand or get frustrated by topics for which they aren't ready. ALEKS ensures that students have the prerequisite knowledge to be successful as the topics continue to build.

Scaling Pedagogical Knowledge and Practice

Project	**ComPAIR Peer Review at UBC—The University of British Columbia Centre for Teaching, Learning & Technology**  View Project Video
User	HED
Objective	Comparison-based peer review
Learning Impact	ComPAIR shows peer work in pairs. Students tap into their comparative judgement skills to identify others' work strengths and weaknesses as well as offer constructive criticism. In 2018, The University of British Columbia used ComPAIR in 60+ courses, hosting 140 assignments, and impacting 5,400 students.
Solution	ComPAIR is an open source application that enables students to review sets of peer work for comparison-based review and feedback. The instructor enters a question into a box and students can submit their assignments in text, equations, videos, or photos. Student work is collected and distributed automatically online for anonymous peer review. Students click on the ComPAIR button and see two answers side-by-side; choose the more effective one; and enter anonymous feedback into a text box. ComPAIR integrates directly with an LMS via IMS Learning Tools Interoperability (LTI).

Project	**Connect Master Economics: A Paradigm Shift—McGraw-Hill and St. Cloud State University** View Project Video
User	HED
Objective	Personalized learning: economics
Learning Impact	Over 250 colleges and universities globally use Connect Master: Economics, resulting in improved student engagement and student learning outcomes. An economics course GPA at St. Cloud State University increased from 2.19 to 2.77 and student pass rates improved from 71% to 79%.
Solution	Connect Master Economics is a personalized learning study tool where content is organized into granular topics, supported by dynamic learning resources including videos, work examples, helpful hints and 'Why this Matters' summaries. Instructors select topics and concepts. Students answer questions and rate their level of confidence; and Connect Master Economics designs a unique learning path for each student. The adaptive workflow presents only relevant learning resources to students, helping them to learn core concepts more efficiently. Connect Master Economics integrates with major learning management systems and allows instructors to add custom content.

Project	**Connect Master: Why Biology? A Relevancy Approach—McGraw-Hill and St. Charles Community College** View Project Video
User	HED
Objective	Theme-based adaptive curriculum: biology
Learning Impact	Currently 3,000 students across 12 institutions have participated in the theme-based curriculum pilot.
Solution	Connect Master: Why Biology? develops content from meaningful themes (e.g., What is cancer?) and threads in biology concepts to make science more relevant to students. This establishes a framework of understanding for the student, allowing instructors to pursue more active learning as well as investigative or critical thinking exercises inside the classroom. Adaptive formative assessment questions allow students to assess their basic principle understanding. Instructors determine their students' proficiency before starting the lesson and then build an adaptive classroom with resources like pre-built courses, syllabi course planning guides, and PowerPoint presentations. Grids enable institutions to map out their current programs' learning objectives to Connect Master: Why Biology? curriculum. Master courses can be built and shared across departments or campuses.

Scaling Pedagogical Knowledge and Practice

Project	**Teach Every Child Connector (SII) at Broward—Public Consulting Group and Broward County Public Schools (Florida)**  View Project Video
User	K-12
Objective	Student accommodation data/instructional resource integration
Learning Impact	Providing single access to the LMS and the student accommodation information enables quicker research about each student's specific accommodations, resulting in better prepared teachers and lessons, and saving BCPS as much as $2.4 million in teacher time.
Solution	Florida's state standards apply to every student, but success depends on knowing each student's specific accommodations. However, BCPS's curriculum and instructional materials are housed in an LMS; student specific accommodation information is housed in multiple systems. The Teach Every Child Connector (TECC) integrates data from BCPS EDPlan Individualized Education Plans (IEPs) into its Canvas LMS via the IMS Global LTI interface. Teachers can now see data for all students with special needs in their course at the bottom of every Canvas page used in lesson planning and instructional delivery.

Project	**Transforming Learning Outcomes with a Data-Driven Approach to Digital Learning—CatchOn, Inc. and Grapevine-Colleyville Independent School District (Texas)** View Project Video
User	K-12
Objective	Engagement measurement: edtech
Learning Impact	CatchOn's usage trend analysis enables schools and districts to assess edTech's return on investment and student learning impact.
Solution	CatchOn's analytics technology compiles up-to-the-minute actionable data on every device, both inside and outside the classroom and presents the usage data in a dashboard. It also provides a real-time digital inventory of all application software across every device type: Chrome, Windows, Mac, and iOS. If edtech usage isn't matching expectations, schools can assess the problem source: lack of training or unawareness or not filling student needs. Marrying CatchOn usage data to academic result enables districts to examine how an edtech tool's usage impacts students learning.

Project	**Using Real-Time Data to Impact Instruction at Lee County Schools—SAFARI Montage and the School District of Lee County (Florida)**  View Project Video
User	K-12
Objective	Digital content engagement measurement platform
Learning Impact	Access to students' performance and engagement data keeps teachers informed while simplifying the instructional workflow. The solution yields higher student engagements levels in School District of Lee County's courses.
Solution	SAFARI Montage assesses students' engagement and performance with video, audio, and other digital content within a digital learning ecosystem. Smart objects are tagged with different metadata which the system collects real time via an IMS Caliper Analytics event feed; and then uploads them into a database that appears immediately on teachers' dashboards. Teachers refer to a single dashboard for engagement and performance information, instead of logging onto each vendors' analytics system. Teachers use the digital learning analytics to help their students be accountable while allowing them to work independently and at their own pace; and can quickly assist or challenge students as needed.

Learning Impact Category: Advancing Teaching and Learning Innovation

Blended Learning Optimization		
Project	**Intervention and Istation at Twin Falls School District—Istation and Twin Falls School District (Idaho)**	View Project Video
User	K-12 (K-5)	
Objective	Customized learning experiences: math and reading	
Learning Impact	Istation's digital assessment tool provides TFSD student reading and math performance data that enable leaders, principals, and teachers to make instructional decisions to benefit the entire district.	
Solution	Istation's reading and math formative assessments details students' knowledge about literacy, including vocabulary, phonemic awareness, comprehension, and fluency. Instructors can use assessment data to pinpoint each student's strengths and weaknesses; and create customized learning experiences in the form of tailored classroom lessons, small-group activities, and remediation exercises. Assessments can be administered monthly or on demand. An entire class can be assessed in under 30 minutes.	
Project	**Study Anywhere with the ReadAnywhere App and McGraw-Hill—McGraw-Hill and St. Charles Community College**	View Project Video
User	HED	
Objective	E-textbook reader mobile app	
Learning Impact	The Read Anywhere app provides 24/7 anywhere student access to textbooks. Over 300,000 students have downloaded the mobile app.	
Solution	McGraw-Hill's Read Anywhere App is an Android and Apple mobile app for all compatible McGraw-Hill e-books. Students can download the entire book or specific chapters. Navigation features help students access appropriate material; other features include content annotation, placeholder marking, and search. It supports smart-book assignments access, where students see text highlighted by the assignment authors when scrolling through the text that point to the most critical content for the assignment and are related to specific learning objectives. Students can access their downloaded reading and assignments when offline.	

Educational Application, Content, and Media Infrastructure

Project	**Expert-Based Collective Advising Mechanism (ECAM)—Advanced Innovation Center for Future Education of Beijing Normal University, Beijing Municipal Commission of Education**  View Project Video
User	K-12
Objective	Online teacher support: rural students
Learning Impact	ECAM's almost 11,000 teachers in 17 Beijing school districts provided almost 67,000 hours of one-on-one online tutoring to 57,000 students in six rural school districts.
Solution	China's rural areas may lack adequate teachers and resources to tutor their students. Expert-based, Collective Advising Mechanism (ECAM) provides online one-on-one tutoring, live classes with advanced digital pen, and micro-lectures services to rural students by Beijing public middle school and high school teachers. ECAM's AI-based, Smart Learning Partner (SLP) platform sorts all learning resources according to the Interdisciplinary Competency Based model, tracks each student's learning process, predicts his mastery level, and recommends reading resources and tutors. It profiles each teacher's expertise to match a student with an appropriate instructor. Digital pens facilitate note-taking and audio recording the session.

Project	**Gaming to Learn—Katy Independent School District (Texas)** View Project Video
User	K-12 LL
Objective	Gamification math concepts
Learning Impact	Students enjoyed the games, spending more time on math studies. Deeper learning engagement resulted in more students passing state and local assessments as well as receiving 'Exceeds Expectations' grade on state assessments.
Solution	Katy Independent School District (KISD) gamified math concepts to create student excitement around math while developing collaboration and problem-solving skills. KISD developed a course within its LMS that chunked math concepts into smaller, achievable problems. Students contribute to a team, or individually progress to the next level, and earn badges upon completing tasks that demonstrate learning and knowledge. Students earned more points with SideQuests, personalized learning experiences to complete tasks with math operations and Covert operations, in-depth problem-solving opportunities based on known concepts. Its success with students prompted KISD to expand the game template to its teachers' technology professional development.

Evolution to Next Generation Digital Learning Environments

Project	**Boost at IU—Boost by University Information Technology Services (UITS) at Indiana University**  View Project Video
User	HED
Objective	Student support mobile app
Learning Impact	Boost's personalized, proactive nudges improved student's adherence to assignments by 3.6% above instructors' announcements. IU's Boost pilot involved about 500 instructors, 750 courses, and 2,000 students.
Solution	Boost is an Indiana University (IU) student support mobile app that reminds students when they have not submitted anything for an upcoming deadline, proactively intervening before a student misses an assignment. It integrates with the Canvas LMS to provide reminders, resources, and encouragement. Boost sends assignment reminders in a daily digest, which students can customize into a personalized feed. It also sends personalized encouragement when students submit their work on time, providing positive reinforcement directly linked to students' learning activities.

Project	**Cisco Networking Academy's Leading-Edge Digital Learning Platform—Cisco Networking Academy** View Project Video
User	LL
Objective	Technology skills
Learning Impact	Cisco delivered curricula to 24,700 educators across 180 countries, with an enrollment of 1.87 million in 2019. Outcome surveys report 93% of students using the course skills that they learned in their daily lives; and 91% of students obtained a job or educational opportunity.
Solution	Cisco Networking Academy provides a range of curricula that are licensed free through partnerships with over 11,000 education entities, including universities, governments, prisons, and community centers. The course materials, teaching resources, and assessments are delivered over NetAcad.com, Cisco's custom cloud-based education platform. The platform scales internationally with alignment to regional privacy regulation. Cisco Networking Academy produces over 30 courses. Students can attend introductory courses online, search for education partners to take instructor-led courses locally, and once qualified they can connect with employers for job opportunities.

Evolution to Next Generation Digital Learning Environments

Project	**DynaSpace, A Service to Transform Corporate Education—NetLearning** *IMS Japan Society Regional Competition Finalist*	View Project Video
User	LL	
Objective	Personalized online professional development course	
Learning Impact	DynaSpace provides personal professional learning development experiences that address individual employee learning needs.	
Solution	DynaSpace provides the tools to create a personalized online professional development learning experience comprised of assessments, real time surveys, elearning, and micro learning workshop management. It utilizes bite-sized content and just-in-time content delivery. The program integrates data from all employee's learning activities—including face-to-face workshops—to identify skills gaps, control tool usage, and to align personal and company goals. With the assessments, digital learning tools, stakeholder supports, and collaborative workshops, each learner identifies and develops competencies s/he needs to grow professionally.	

Project	**Quick Check at IU—Indiana University**	View Project Video
User	HED	
Objective	Formative assessment	
Learning Impact	Low stakes formative assessments promote active learning and improve student motivation, especially in complex disciplines. Since its 2016 launch at IU, 1,500+ classes and 45,000 students have used Quick Check.	
Solution	Quick Check embeds formative assessments into online course sites, with a range of question formats. It is seamlessly integrated with an LMS, performs grade passback through LTI, and also logs advanced analytics about student progress and behavior. Instructors create and edit question sets; and deploy these assessments as external tool assignments. Students can complete the assessments as many times as they want, and Quick Check only submits to the gradebook the highest earned grade before the assignment deadline. As students complete their work, Quick Check populates analytical dashboards displaying student- and assessment-level insights into learning comprehension and performance.	

2019 Learning Impact Awards Program Evaluators

Special thanks to the team of judges for the 2019 Learning Impact Awards competition. This volunteer group serves to evaluate the Learning Impact Award nominations, contribute to the development of the annual Learning Impact Report, and identify priorities needed to evolve the Learning Impact Awards program.

If you are interested in participating as a Learning Impact Awards evaluator, contact info@imsglobal.org.

Nori Barajas-Murphy
EDUCAUSE
United States

Nynke de Boer
IMS Global Learning Consortium
Netherlands

Gary Driscoll
Educational Testing Services
United States

Nicole Duchesneau
Volusia County Public Schools
United States

Dorothy Evans
Gwinnett County Public Schools
United States

David Goodrum
Oregon State University
United States

Jeanne Imbriale
Baltimore County Public Schools
United States

Tom Ingram
Escambia County Public Schools
United States

Lisa Mattson
IMS Global Learning Consortium
United States

Mark McCallister
University of Florida
United States

Colin Smythe
IMS Global Learning Consortium
England

Kelvin Thompson
Executive Director, Center for Distributed Learning
University of Central Florida

Nick Thompson
UCLA
United States

Paul Turner
University of Notre Dame
United States

Shannon Wilson
University of Phoenix
United States

IMS Global Learning Consortium recognizes the contribution by **Judith A. Pirani**, principal, Sheep Pond Associates, and author of the 2019 Learning Impact Report.

About IMS Global Learning Consortium

IMS Global is a non-profit organization that advances technology to scale and improve educational participation and attainment affordably. IMS Global members are leading suppliers, higher education institutions, K-12 districts and schools, and government organizations that are enabling better teaching and learning by collaborating on interoperability and adoption initiatives. IMS Global sponsors the Learning Impact Leadership Institute, an annual program focused on recognizing the impact of innovative technology on educational access, affordability, and quality while developing the leadership and ideas to help shape the future of educational technology.

801 International Parkway
5th Floor, PMB #112
Lake Mary, FL 32746

Contact IMS online www.imsglobal.org/contactus.cfm or email info@imsglobal.org for more information.

Visit www.imsglobal.org/li/2020 for conference details and to register.

The views expressed in this report are solely those of IMS Global Learning Consortium and contributors.