THE EDTECH OPPORTUNITY:

EDUCATIONAL TECHNOLOGY AS A DYNAMIC GROWTH SECTOR FOR IOWA

EXECUTIVE SUMMARY

PREPARED FOR:
Iowa Economic Development Authority

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EDTECH AS AN INDUSTRY SECTOR FOR IOWA'S ECONOMIC DEVELOPMENT INNOVATION PLATFORM

Education is fundamental to the performance of all other sectors of the economy. It also is a sector that stands on its own as a distinct market—requiring products, technologies, content and intellectual assets to enable its work. Increasingly, technology (especially digital technology) has become a key component of the education sector. The educational technology (EdTech) market space specifically, has emerged as a large, fast-growing and important domestic and global sector.

IOWA EDTECH INDUSTRY PROFILE

OVER 3,100
EMPLOYEES AT
28 SECTOR COMPANIES
IN IOWA

DIVERSE MIX
OF LARGER, MATURE
COMPANIES & NUMEROUS
MORE RECENT STARTUPS

$22.7 MILLION
IN VENTURE CAPITAL
OR ANGEL INVESTMENTS
RAISED SINCE 2010

EdTech represents an advanced industry, high in technological content. It also requires a specialized workforce, with expertise not only in the typical technology-oriented science, technology, engineering and mathematics (STEM) fields prevalent in digital sectors, but also in creative and artistic skills relative to content, and expertise in pedagogy, psychometrics and performance assessment.

ABOUT THIS REPORT

In conversation with representatives of the EdTech sector in Iowa, the Iowa Economic Development Authority (IEDA) determined that the specialized assets and industry base in the state may warrant consideration of EdTech as a strategic sector for furthering Iowa's economic growth.

Given the strong projected growth in EdTech markets, the Iowa assets in EdTech potentially represent a pathway toward expanded business output and employment growth for Iowa in a dynamic, advanced-industry, Technology-Based Economic Development (TBED) sector. EdTech could present a strategic opportunity cluster for Iowa to pursue—along the same lines of Biosciences and Advanced Manufacturing. TEConomy Partners, LLC (TEConomy) was selected to conduct an evaluation of the EdTech sector in Iowa as an industry "cluster" for future growth. IEDA's Iowa Innovation Council (IIC) EdTech Workgroup led the work on this report, providing feedback on the TEConomy Analysis and helping narrow the focus to those platforms holding the most promise for Iowa economic development AND most likely to benefit from state programs, industry-university partnerships and other sector stimulating activities.

ANALYSIS AND REPORT SEEKS TO ANSWER THREE QUESTIONS

1 WHAT ARE IOWA'S EXISTING AND EMERGING EDTECH RESEARCH CORE COMPETENCIES?

2 IN WHICH EDTECH SECTORS IS IOWA SEEING TRANSLATION OF THESE RESEARCH CORE COMPETENCIES INTO COMMERCIAL ACTIVITY AND COMPETITIVE TECHNOLOGY PLATFORMS?

3 WHAT STRATEGIES CAN HELP IOWA CAPITALIZE ON THESE OPPORTUNITIES AND SPUR FURTHER EDTECH-BASED ECONOMIC DEVELOPMENT?

THE MARKET FOR EDTECH

The EdTech market is highly attractive in terms of its size and growth rate. The global market was estimated in 2017 to be $57.7 billion, comprising $23.7 billion in hardware, $16.5 billion in software, and $17.5 billion in content development. Overall, between 2017 and 2022, the EdTech market is projected to grow at a strong five-year compound annual growth rate (CAGR) of 14 percent. This would increase the projected size of the global EdTech market to $110.9 billion by 2022.

SIZE OF EDTECH GLOBAL MARKET

$57.7 BILLION

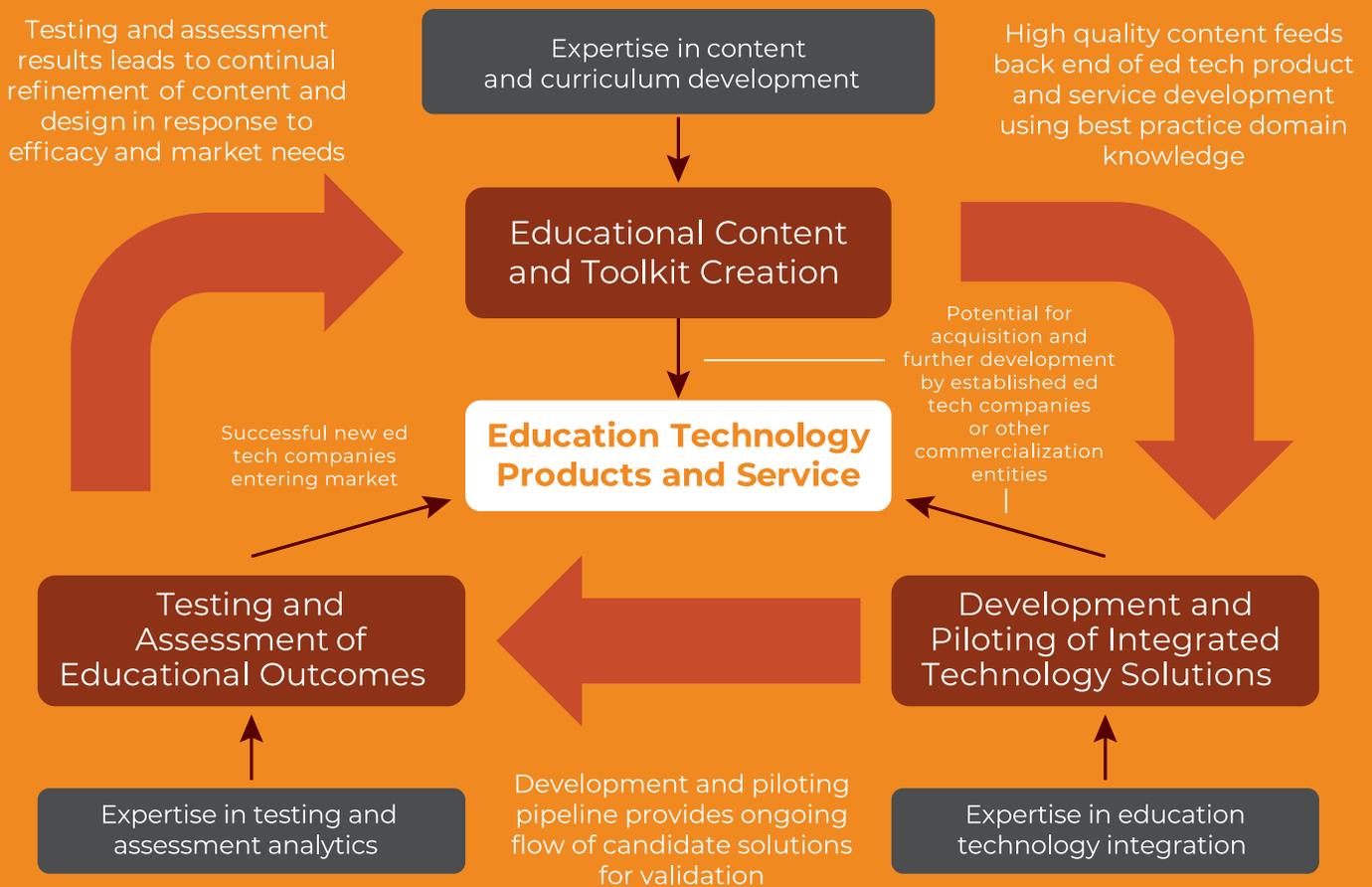| $23.7B	$16.5B	$17.5B
HARDWARE	SOFTWARE	CONTENT

Source: BCC Research

EDTECH AND IOWA

With Iowa being home to ACT, founded in 1959 in Iowa City, the state has a long-standing presence in the commercial side of the sector. Other major companies also are based in, or have a significant presence in Iowa, such as Kendall Hunt (publishing/content), McGraw-Hill Education (publishing/content) and Pearson (publishing/content/assessment).

There has also been notable EdTech startup activity in Iowa, with an expanding base of EdTech entrepreneurial ventures founded and successfully growing within Iowa. The University of Iowa, Iowa State University and the University of Northern Iowa each have research programs focused around, or highly related to, educational technology, instructional technology, psychometrics and assessment; and there is work in associated specialized hardware and software spaces such as virtual reality and augmented reality (VR/AR).

University Core Competencies Form the Foundation for "Outer Ring" of EdTech Commercialization Cycles

Testing and assessment results leads to continual refinement of content and design in response to efficacy and market needs

High quality content feeds back end of ed tech product and service development using best practice domain knowledge

Expertise in content and curriculum development

Educational Content and Toolkit Creation

Potential for acquisition and further development by established ed tech companies or other commercialization entities

Successful new ed tech companies entering market

Education Technology Products and Service

Testing and Assessment of Educational Outcomes

Development and Piloting of Integrated Technology Solutions

Development and piloting pipeline provides ongoing flow of candidate solutions for validation

Expertise in testing and assessment analytics

Expertise in education technology integration

UNIVERSITY RESEARCH STRENGTHS, ASSETS AND CORE COMPETENCIES TO SUPPORT EDTECH INDUSTRY DEVELOPMENT

Iowa State University

The strengths of Iowa State University (ISU) in technology and computer science, which overlaps with strengths in engineering research, are evident in its education research activities that align with the key EdTech discipline areas of education research and computer and information sciences. Several key centers and research institutes at ISU aligned with the EdTech space include the following:

- The Virtual Reality Applications Center
- The Center for Technology in Learning and Teaching
- Center for Excellence in Learning and Teaching

University of Iowa

The University of Iowa anchors an internationally recognized College of Education that has a long history of excellence in educational measurement and assessment as well as content development. Several university assets that are particularly aligned with development of EdTech capacity include the following:

- The Baker Teacher Leader Center
- Center for Advanced Studies in Measurement and Assessment
- The Center for Evaluation and Assessment
- Iowa Testing Programs
- Iowa Reading Research Center
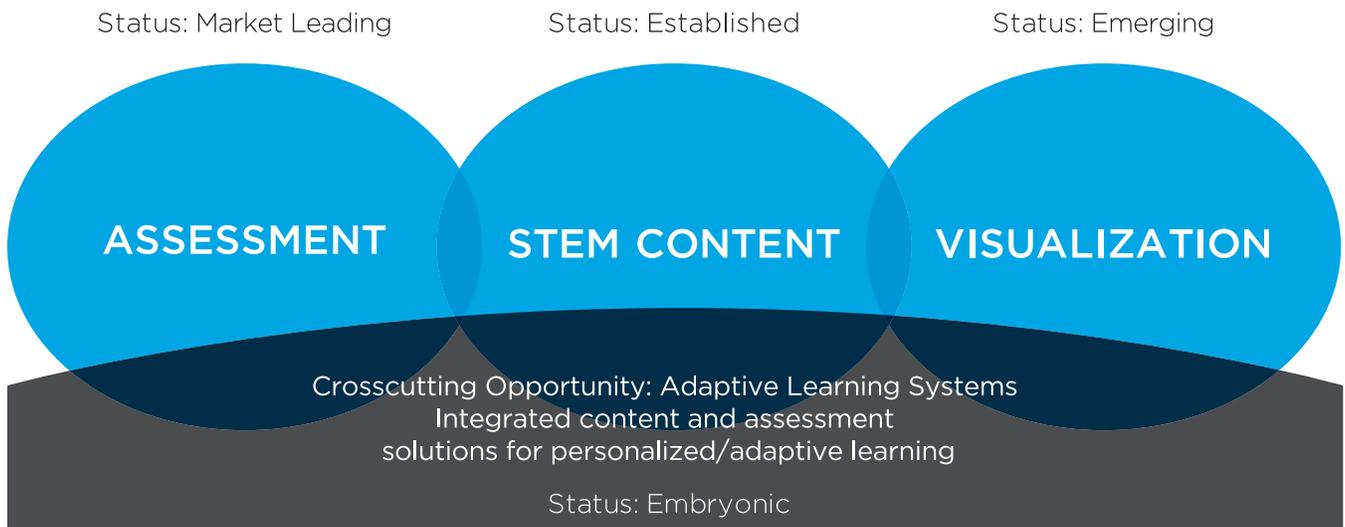
University of Northern Iowa

The University of Northern Iowa houses a comprehensive set of research programs focused on educational content creation and professional development as well as a variety of other centers and programs that are exploring EdTech applications. Key university research assets in this space include the following:

- Center for Educational Transformation
- Center for Early Education in Science, Technology, Engineering and Mathematics
- National Program for Playground Safety

Collectively, the specialties across the public research universities represent assets for a strong foundation for technology development and commercialization in EdTech.

RECOMMENDED PLATFORMS FOR EDTECH DEVELOPMENT IN IOWA

The assessment of Iowa core competencies and assets in EdTech clearly show expertise to be centered in EdTech applications (primarily software based) as opposed to EdTech hardware. Iowa's EdTech industry predominantly groups into three main clusters of activity and a fourth crosscutting activity:

Status: Market Leading   Status: Established   Status: Emerging

ASSESSMENT   **STEM CONTENT**   **VISUALIZATION**

Crosscutting Opportunity: Adaptive Learning Systems
Integrated content and assessment
solutions for personalized/adaptive learning

Status: Embryonic

Source: TEConomy Partners, LLC

Assessment

This platform includes providers of educational testing solutions for K–12, higher education and continuing education/workforce training applications. A well-established and long-standing area of expertise and business development for the state, it comprises university-based and industry R&D through to leading high-profile companies in the assessment industry (including ACT, Pearson, College Board and Iowa Testing Programs). This is the largest of the three existing EdTech platforms identified for Iowa in terms of employment.

STEM Content

The term "content knowledge" describes the body of knowledge and information that teachers teach and that students are expected to learn in a given subject area, such as mathematics, social studies or biology. Content knowledge generally refers to the facts, concepts, theories and principles that are taught and learned in specific academic courses. This platform incorporates organizations and companies involved in the creation, publishing and distribution of educational content, which may be text, video, audio based or multimedia. STEM content is a particular emphasis area for the platform because of the profile of the existing base of Iowa companies engaged in content and because of the demand for such content.

Content Visualization and VR Systems

The digitalization of content is enabling educational materials to be viewed in ways that enhance understanding and the educational experience. Using VR and other advanced visualization technologies, students can manipulate and understand 3-D illustrations and fly-through models of biological structures, anatomy, chemical compounds, engineering designs and a host of other content.

Adaptive Learning Systems

The phenomenon of "convergence" is driving the development of an Iowa position in a fourth platform, Adaptive Learning Systems (ALS). Adaptive learning, also known as adaptive teaching, is an educational method that uses computer algorithms to manage the interaction with the learner and deliver customized resources and learning activities to address the unique needs of each learner.

For Iowa, the powerful concentration of assessment platform expertise is a key "attractor" for convergence opportunities in ALS. Assessment is a highly specialized and sophisticated field, and Iowa is a hub for multiple leading companies in the space and has an active track record in academic research and graduate training relevant to the sector. The presence of a significant base of STEM content companies in Iowa, and advanced visualization companies with interests in education, provides a potentially dynamic opportunity for this fourth platform to be pursued via facilitated convergence in the state.

The phenomenon of technology convergence is not new. Many products contain multiple components that have had unique development pathways prior to converging into a novel product (for example, GPS, mobile telephone, camera and Internet browser converging into a smart phone). What is perhaps more of a current phenomenon is convergence that is of a larger scale in terms of distinct industry sectors, which originally operated largely independent of one another, starting to merge together. In this new convergence paradigm, technologies and companies from one sector converge with those from another (or several others) to provide a combined solution to market needs and opportunities. Convergence is largely being driven by the "digitalization of everything" whereby advanced and emerging disruptive cyber/digital technologies (AI, Internet of Things, VR/AR, big data, cloud computing, etc.) make possible the automation of processes, the analysis and management of highly complex systems and decisions, and greater customization of solutions.

MARKET OPPORTUNITY

The market opportunity for the EdTech platform in Iowa is significant. The projected market size in each platform for North America, based on market research data and the CAGR projections through 2022, suggest that these markets combined will grow from between $9.8 million and $10.3 million in 2017 to between $15.1 million and $15.6 million in 2022.

North American Market Size for Three EdTech Platforms

Platform	2017 ($ in Millions)	2022 ($ in Millions)
Assessment	$2,000–$2,500	$2,500–$3,000
Content (Digital)	$7,800	$11,900
Visualization (VR)	$40	$700
Total	**$9,840–$10,340**	**$15,100–$15,600**

BCC Research projections for development of the ALS market in North America

	2017 ($ in Millions)	2022 ($ in Millions)
Adaptive Learning Systems	$1,408.3	$2,848.7

STRATEGIES AND ACTIONS FOR GROWING IOWA EDTECH PLATFORMS

Iowa has the potential to add upward of 1,000 jobs in the EdTech sector over the next five years—but, realizing this opportunity will require a strategic focus on connecting ecosystem organizations and companies, enhancing the piloting and demonstration environment for EdTech in the state, improving the entrepreneurial ecosystem and creating and encouraging workforce development activities.

Four primary strategic imperatives were developed for advancing EdTech sector growth in Iowa. These imperatives form the basis for four strategies and a series of associated actions.

STRATEGIC IMPERATIVES

1	2	3	4
Collaboration Facilitation and Cluster Networking	Piloting and Adoption Environment	Entrepreneurial Ecosystem Development	Workforce Development and Access

STRATEGY **1**

Collaboration Facilitation and Cluster Networking

Action 1.1
Create an EdTech Iowa collaborative cluster to provide focus and dedicated effort within an existing Iowa TBED organization (Iowa City Area Development Group recommended).

Action 1.2
Fund initial EdTech Iowa operations through a public/private partnership.

Action 1.3
Review opportunities for strategic collaborations with existing complementary Iowa organizations (e.g., Technology Association of Iowa).

Action 1.4
Develop and host annual EdTech Iowa Conference. Start initially with a half-day add-on to existing ACT conference and build from there as needed.

Action 1.5
Research Application Programming Interface platforms as "best fit" for Iowa company connectivity and path to market access.

STRATEGY **2**

Piloting and Adoption Environment

Action 2.1
Identify existing K–12 and higher education institutions that have collaborated with Iowa companies (e.g., STEM Scale-up Program and STEM BEST participant schools) for testing and piloting.

Action 2.2
Develop a mobile EdTech Iowa demonstration lab.

Action 2.3
Assess/consider non-school environments for piloting and testing.

Action 2.4
Develop training and exposure program in EdTech for teachers and superintendents, leveraging existing teacher outreach and training efforts through Governor's STEM Advisory Council.

Action 2.5
Conduct needs assessment, using Iowa STEM Evaluation Report and other Future Ready Iowa workforce training resources as benchmarks, to determine the pain points and needs EdTech can uniquely help address.

STRATEGY **3**

Entrepreneurial Ecosystem Development

Action 3.1
Promote regional incubator and coworking space for EdTech within existing spaces/organizations.

Action 3.2
Form EdTech Iowa mentoring network.

Action 3.3
Develop "Pitch Panel" for annual conference.

Action 3.4
Build relationships with VC firms and early-stage investors with proven interests in EdTech. Identify investors in Midwest ventures.

Action 3.5
Develop an "Assessment Integration Lab" in Iowa City.

Action 3.6
Promote EdTech entrepreneurship within Iowa research universities.

STRATEGY **4**

Workforce Development and Access

Action 4.1
Develop a transdisciplinary EdTech graduate degree program (Education, Comp. Science, Business Studies, etc.).

Action 4.2
Connect rising IT software talent with EdTech companies pre-graduation, leveraging existing State of Iowa efforts, such as Future Ready Iowa, apprenticeship and internship programs.

Action 4.3
Promote connectivity between EdTech firms and Iowa software and app development firms.

Action 4.4
Integrate EdTech needs into existing IT workforce development plans.

Action 4.5
Attract and recruit management talent with EdTech experience.

Action 4.6
Review existing "This is Iowa" marketing campaign and identify any case studies or examples to specifically help link employers to job candidates in the EdTech space.*

Action 4.7
Conduct occupational needs assessment and demand projections study for the sector in Iowa.

* Existing IEDA initiative incorporated into original recommendation.

LONG TERM, THE UPSIDE POTENTIAL OF INVESTING IN EDTECH IS SIGNIFICANT

Building upon existing assets, Iowa has an opportunity to further advance its economy through EdTech as a technology based economic development sector. Currently, EdTech does not represent an "organized" cluster in Iowa—i.e., there is no development organization that is focused on bringing the assets and components of the sector together for mutual advancement and to address needs and opportunities across the associated ecosystem. Still, companies have been finding one-another, and university resources and developing collaborations—so characteristics of the sector in Iowa point to a favorable environment for strategic coordination.

In a knowledge-based advanced economy, education and human capital skills will be a crucial determinant of economic performance and, as such, EdTech represents a marketplace with an assured and fast-growing demand for products and services. Iowa already has many of the assets for success in place, and now needs to coordinate implementation of targeted strategies and actions to leverage these assets and build upon them further to realize its full EdTech-sector growth potential.

IOWA INNOVATION COUNCIL

The Iowa Innovation Council is a business-led group that develops strategies and long-term plans to make sure Iowa stays competitive in the global business economy. As an advisory council to IEDA, the IIC develops recommendations on programs, services and policies needed to support existing businesses and increase the chance for success for entrepreneurs.

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The EdTech Opportunity: Educational Technology as a Dynamic Growth Sector for Iowa full report can be found at **https://www.iowaeconomicdevelopment.com/our-agency**

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