Science, Technology, Engineering, and Math (STEM) are THE foundation skill sets a person must have to compete and contribute globally.

"Innovations and creativity in science, technology, engineering and math (STEM) will be the drivers of tomorrow's economy. If you are not a participant on that frontier, you will trail behind it and possibly get left behind entirely." ---Neil deGrasse Tyson, American astrophysicist

STEM	Technology Enhanced Instruction: Recommendations for Action	
Area	Action Plan	Possible Collaborators
Technology- Enhanced Learning	 Create Real-world and Relevant STEM Curricula Promote and develop project based learning at the upper levels of Bloom's Taxonomy Incorporate interactive and technology- rich STEM content Promote Collaboration (all learners, local to global, multiple formats) Develop Individualized, personalized/customized, mobile, gaming learning experiences (at some point in the future) Provide Online and Blended Learning Opportunities - 24/7 Promote Formal/Informal Environments for Learning Engage students in an ever-expanding series of high interest activities/learning experiences that develop the skills and interests enabling success in STEM-related careers. 	Teachers (formal and informal) Students School Administrators Curriculum Writers Instructional Designers Business Partners (relevancy) Tech support personnel Game developers Administrators for face-to-face and online delivery, STEM experts and end-users, Professional Organizations (e.g., ITEC, NSTA, NCTM, ISTE, iNACOL)
State Infrastructure and Resources	 Provide Statewide High-speed Connectivity Provide Support for Multiple Devices Utilize Cloud Computing Capabilities Develop and Support Online STEM Content Repository Refine Mechanism for Quality-control for All Learning 	ICN, Wireless providers, Technology personnel, Cloud computing providers, Content Repository Administrator, etc.(-current repository in development (Equella) Non-profit organizations
Teacher Preparation Professional Development (PD) Support	 Create an Iowa TIM: <u>Technology Integration Matrix</u> Promote STEM Content, Pedagogy and Technology for Teachers Provide PD in Blended Learning Pedagogy for Pre-service and In-service Teachers in STEM fields Promote Use of Trans-disciplinary Content & Habits of Mind Provide Opportunities and Support for Teacher Peer Mentoring Foster and Conduct Action Research in STEM areas 	Collaborative Development Committee for TIM (State level), Teacher Preparation Programs, PD Providers, AEAs, Mentors (Content and Technology), Local School Districts, Professional Organizations (e.g., ITEC, NSTA, NCTM, ISTE, iNACOL)
Digital Communication	 Establish Professional STEM Learning Communities Establish Centralized Digital Location for Iowa STEM Resources Establish STEM Learning Academies Foster and Conduct Action Research in STEM areas 	Cloud Providers, Administrator for Iowa Repository, Regional STEM Directors, Current STEM program providers (-current example of action research is Communities of Practice and Innovation), Local School Districts, Universities & Colleges

Beyond the traditional classroom	 Create Statewide "tech extension" Office (aligned with STEM Hubs) 	Private business and professional partners, Community Colleges, AEAs, Universities and Private Colleges, Non-profit organizations
	 Engage/establish STEM Community Coaches/Collaborators Explore and support competency based education pathways (see Badge concept- STEM Scouts) Support and develop online learning opportunities Training in the application and use of 21st century digital tools 	
Assessment /Quality Control	 Initiate and implement mechanisms for insuring quality of instruction and learning (i.e., face-to-face, online) Assess intended curriculum (written curriculum/content), enacted curriculum (instruction), and what is learned (competencies) Engage in continuous improvement cycle to assess, adjust and improve curriculum, instruction and student results(learning) Define competencies-STEM and Universal Constructs 	Collaborative Development Committee for Quality Control and Assessment (State level), Universities & Colleges, Department of Education, Business and Industry. ACT, Pearson, McREL, K-12 teachers

Respectfully Submitted by

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