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## Partnering Industry and Education for Curricular Enhancement: A Response for Greater Educational Achievement

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**PARTNERING INDUSTRY AND EDUCATION  
FOR CURRICULAR ENHANCEMENT: A RESPONSE FOR  
GREATER EDUCATIONAL ACHIEVEMENT**

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**Abstract**

Despite high rates of unemployment, research indicates that employers are having a difficult time finding workers that have the knowledge and skills needed for available jobs. President Obama, state lawmakers, and national higher education associations are calling upon educational institutions to not only fill the current gap but to reach aggressive goals set for educational attainment in the U.S. by 2020. This article looks at a historical view of how education has met workforce needs in the past, employment projections, employer needs, and how educational institutions might respond to the call to develop a highly skilled workforce. In addition, a model designed to partner industry and education in the development of educational curriculum is offered to promote conversation as to how to better prepare workers and future graduates with the competencies and employability skills needed to perform in an ever-changing workforce.

Keywords: curriculum development, education/business partnerships, employability, employment trends, higher education, workforce education, workforce skills

## **PARTNERING INDUSTRY AND EDUCATION FOR CURRICULAR ENHANCEMENT: A RESPONSE FOR GREATER EDUCATIONAL ACHIEVEMENT**

### **Introduction**

*Times they are a-changin'*. These familiar lyrics, written by Bob Dylan in the 1960s, were inspired by the social and political climate of the time and described the revolutionary mindset that existed. That same lyric could be used to describe the rapid changes taking place in today's workforce. With technological advances and a global economy, the times are quickly changing as are the needs of employers throughout the country. As a result, educational institutions are finding themselves with the challenge of preparing a workforce for a race that is seemingly hard with which to keep pace.

In order to keep up with workforce demands over the next decade, it will be crucial for institutions of higher education to keep their finger on the pulse of the skills and education needed by workers to not only fill anticipated jobs, but to adequately prepare workers to compete in an educationally progressive world. Despite high rates of unemployed workers, employers have indicated that they are having difficulty finding employees that have the skills needed for the jobs that are available (ACTE, 2010; Glenn, 2007; Matthews & Lumina Foundation for Education, 2010; National Skills Coalition, 2011; Winsman, 2010). In the policy brief entitled *Top 10 Higher Education State Policy Issues of 2011*, state lawmakers have recognized this need and have presented a challenge to public colleges and universities to develop a plan of response to workforce needs in their region (American Association of State Colleges and Universities, 2011). Educational institutions are particularly affected by these changing times and may find themselves modifying how they operate as a result of intrinsic responses to a perceived need or extrinsic responses through stakeholder collaboration (Foskett, 2005).

This article will take a look at a historical view of how education has met workforce needs, employment projections, employer needs, and how educational institutions might respond to the call to develop a highly skilled workforce. In addition, a model designed to partner industry and education in the development of educational curriculum will be offered to promote conversation as to how to better prepare workers and future graduates with the competencies and employability skills needed to perform in an ever-changing workforce.

### **Discussion**

#### **Historical View of Educational Response**

Educational reform in response to economic and societal change is nothing new. In *America's Perfect Storm: Three Forces Changing Our Nation's Future* (Kirsch, Braun, Yamamoto, & Sum, 2007), authors describe three converging forces which will have a major affect on the nation: economic changes, worker skill gaps, and demographic trends. While this

appears to be the perfect storm, it could be argued that the nation has gone through similar storms in the past and have found ways to keep its head above water.

When the United States moved from an agrarian economy to the industrial age in the mid 1800s, the need for a broader skill set across a larger population prompted an educational response (National Skills Coalition, n.d.). It could be argued that the country was experiencing some of the same forces that are being experienced today. The economy was changing and the skill sets needed to drive that economy had to be developed accordingly. As a result, investments were made to provide access to education for the masses. One of those investments, introduced by Vermont representative Justin Smith Morrill, became what is now known as the Morrill Land Grant Act of 1862. The Morrill Act granted funds to establish state colleges with the purpose of expanding access to education in agriculture and the mechanical arts (Goldin, 1999). This funding was responsible for helping to provide a skilled workforce to meet the needs of the day and to promote economic prosperity.

In the early 1900s, a movement to increase the number of high school graduates was in full swing. In 1907, only 10% of the high school age population had graduated high school; by 1940, that number had increased to 51% (Goldin, 1999; National Skills Coalition, n.d.). This “high school movement”, which created access to free public education, not only dramatically increased educational attainment among youth, but placed the United States in a lead position in mass elementary school education (National Skills Coalition, n.d.).

The increased rate of high school graduates by 1940 was followed by a key piece of legislation in the aftermath of World War II. The signing of the Serviceman’s Readjustment Act of 1944, or G.I. Bill, continued the educational advancements of the country by providing allowances for education and training to veterans for their service. Between 1944 and 1956, over 2 million servicemen and servicewomen had benefitted from the G.I. Bill by obtaining a four-year degree; another 6 million had received training in middle-skill occupations (National Skills Coalition, n.d.). The G.I. Bill was instrumental in furthering the movement to produce a high volume of trained and educated workers, a feat that no other country had accomplished to that point.

Goldin (1999) goes on to report that, despite early educational advancements, the United States is now beginning to fall behind some developed countries who have studied the American model of education and other countries are rapidly closing the gap. Susan Traiman, Director of Education, Innovation, and Workforce Policy for the Business Roundtable suggests, “It’s not that we have a worse education system. It’s that we’re improving incrementally, while other countries are racing past us. We’ve not felt the same urgency as other countries that basically copied our game plan. They adopted the American Dream through education” (Jones, 2010).

### **The Good News: Employment Projections**

The good news is, according to a report by the Bureau of Labor Statistics (2009a), total employment is expected to increase by **10.1%** by 2018 which equates to over 15 million jobs. This projected increase is larger than that of the previous decade, 1998-2008, as the recession which began in late 2007 had a direct impact on employment statistics. The report also addresses the aging baby-boom population and the effect they have had on the labor market. After a 50-year downward trend, the workforce participation rate of those 55 years of age and older began to reverse with an upward trend in 1995 and the number of older workers participating in the labor force continues to rise.

Projections indicate that high growth employment areas will be in service-providing sectors which are predicted to represent 96% of the increase in total employment (Bureau of Labor Statistics, 2009b). Specific areas of growth detailed in the report include:

1. Professional and Business Services
  - a. Management, Scientific, and Technical Consulting
  - b. Computer Systems Design
  - c. Employment Services
2. Health Care and Social Assistance
  - a. Physician's Office Employment
  - b. Home Health Care
  - c. Services for the Elderly and Persons with Disabilities
  - d. Nursing Care Facilities

Higher education institutions will be in a position to make a significant impact in producing a highly skilled workforce if they are aware of these workforce trends and adjust curriculum and instruction accordingly. In fact, half of all new jobs over the next decade are expected to require a post-secondary degree and nearly half of the fastest growing occupations will require a bachelor's degree or higher (Bureau of Labor Statistics, 2009a).

Among the list of fastest-growing occupations, those requiring a bachelor's degree or higher include: biomedical engineers; network systems and data communications analysts; financial examiners; medical scientists; physician assistants; biochemists and biophysicists; athletic trainers; computer software engineers; veterinarians; environmental engineers and technicians; survey researchers; physical therapists; and personal financial advisors (Bureau of Labor Statistics, 2009b).

The list of fastest-growing occupations also encompasses a significant number of jobs which will require more than a high school education but less than a bachelor's degree: home health aides; personal and home care aides; skin care specialists; physical therapists aides; dental hygienists; veterinary technologists and technicians; dental assistants; medical assistants; physical therapist assistants; occupational therapist aides; pharmacy technicians; environmental engineering technicians; and occupational therapist assistants (Bureau of Labor Statistics, 2009b). Reports from the National Skills Coalition (2011) also highlight the fact that middle-skilled jobs will represent a high percentage of employment opportunities.

### **The Bad News: An Unprepared Workforce**

Despite the projected job growth, a survey of over 400 employers throughout the United States revealed that new entrants to the workforce lacked many of the skills vital to job success (Casner-Lotto & Barrington, 2006). Barnett, Parry, and Coate (2001) outline proposed changes in the undergraduate curriculum which will need to move from traditional curricula to what could be defined as emerging curricula in order to meet employer needs (see Table 1).

Table 1. Traditional vs. Emerging Curricula

<b>TRADITIONAL CURRICULA</b>	<b>EMERGING CURRICULA</b>
Knowing That	Knowing How
Written Communication	Oral Communication
Personal	Interpersonal
Internal	External
Disciplinary Skills	Transferable Skills
Intellectual Orientation	Action Orientation
Problem-Making	Problem-Solving
Knowledge as Process	Knowledge as Product
Understanding	Information
Concept-Based	Issue-Based
Knowledge-Based	Task-Based
Pure	Applied
Proposition-Based Learning	Experiential Learning

When asked to rank a list of skills based on their increase in importance over the next 5 years, employer respondent's ranking of applied skills surpassed that of basic skills. Another study revealed that employers were concerned about student's "lack of ability to translate academic writing skills in to practical every-day skills of use in the workplace" (Gray, Emerson, & Mackay, 2005).

Regarding who was responsible for workforce readiness, 75.6% of employers placed the primary responsibility on K-12 schools and 68.4% placed the responsibility on the 4-year college/university (Casner-Lotto & Barrington, 2006). Among interviews conducted for the study, employers suggested that partnerships be built with educational institutions in an effort to communicate critical employability skills needed for the workplace and how those needs could be adequately addressed by educators.

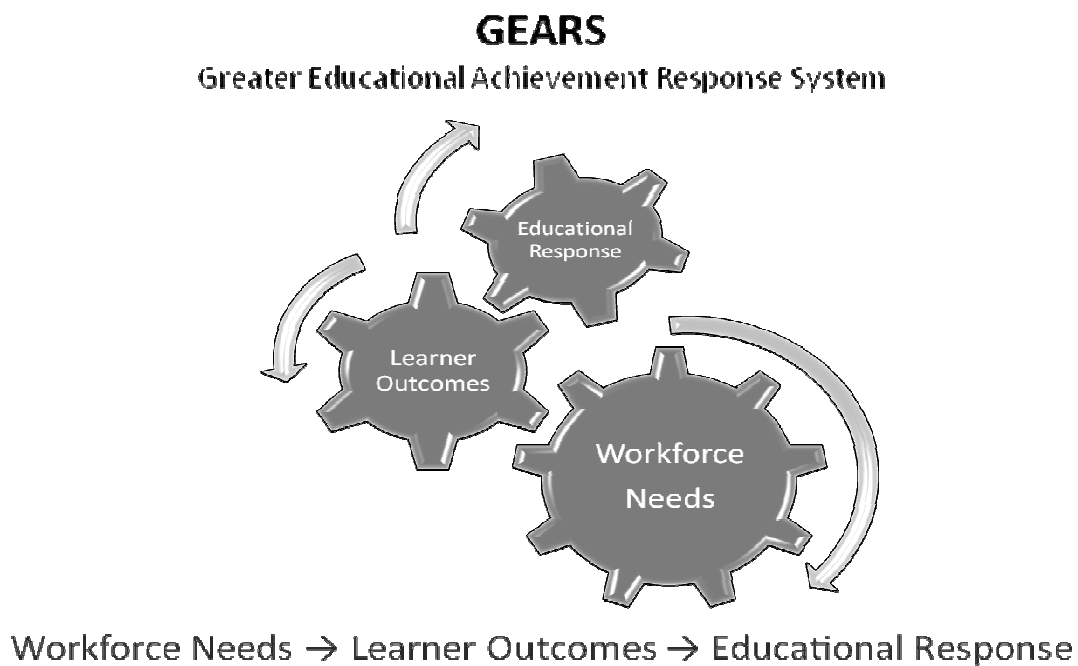
In addition to the communication of critical skills in the development of educational responses, survey respondents felt that it would be important for companies to offer more internship opportunities which would serve to develop meaningful, real-world learning experiences for students (Casner-Lotto & Barrington, 2006). The study also revealed comments by employers, including the following statement, which further demonstrated the value of the company/educational institution partnership.

At Shell Trading and Shipping, for example, which reports excellent results in terms of new entrants' workforce readiness, a key ingredient seems to be a close top-level connection between the company, universities, and high schools. According to William Fitzpatrick, Vice President for Human Resources, executives from Shell work closely with the presidents, deans, and faculties from 23 universities helping to develop curriculum and programs in engineering and geology and structuring internships. In addition, the company works with the universities in reaching out to schools in order to communicate to students the importance of math and science and their connection to

careers in engineering, geology, and information technology. (Casner-Lotto & Barrington, 2006, p. 55)

This industry/education partnership concept can be depicted by a simple graphical model (see Figure 1) which uses the needs of the workplace as the catalyst to develop an educational response. This *Greater Educational Achievement Response System* (GEARS) considers the needs of the workforce as the primary engine that is used to develop learner outcomes which will then generate the educational response. In essence, identification of workforce needs is the main “gear” that starts the wheels turning toward developing learning outcomes and creating an appropriate educational response to meet those outcomes.

Figure 1: Greater Educational Achievement Response System



Although the needs of the workforce have been the driving force behind Career and Technical Education (CTE) programs at community colleges and workforce training facilities, a consideration of this model for curriculum modification in the four-year institution will also be vital to producing graduates who have obtained employability skills that more closely match those of potential employers.

An interview with Lumina Foundation CEO, Jamie Merisotis, echoed the need for partnerships between industry and education (de Vise, 2011). Merisotis suggested the creation of “credentialed labor pools” which would consist of institutions of higher education, government, and industry stakeholders and would serve to develop accelerated educational programs in high-growth sectors. He also recommended that programs be developed based upon learning outcomes rather than seat time. Merisotis proposed that this type of system would encourage the expansion of competency-based programs, prior learning assessments, and improved learning.



A Nebraska employer expressed similar sentiments in a meeting of business, industry, and educational leaders who later developed FutureForce Nebraska as a means to support economic development through state-wide partnerships (Glenn, 2007). The employer explained that, “In the 1980s, business and industry asked for more academics. Education responded by providing more academics. What we should have asked for is *better* academics” (Glenn, 2007, p. 26). This statement summarized the need for contextual academics or being able to apply what is being taught by knowing the “how and why”.

The gap between industry and academics has forced educational institutions to look more closely at aligning classroom teaching with workforce needs. In addition, the concept of lifelong learning has brought the older student back to the classroom but with different needs and expectations. Adult learners do not just look for a degree but expect relevancy to real-world occupations. Programs which combine classroom theory with practical application may be the appropriate response from higher education as tomorrow’s workforce will not only need knowledge but will need experience in applying that knowledge (Fischer & Glenn, 2009).

### **Transforming Curriculum Development**

There is no shortage of initiatives to increase the educational attainment and employability of workers in the United States. The Lumina Foundation, along with President Obama, state government, and national higher education associations, has set aggressive goals for educational attainment in the U.S. over the next decade (Matthews & Lumina Foundation for Education, 2010). The goals not only focus on attainment of postsecondary degrees or credentials but may place an even higher focus on educational quality and relevance. In their 2010 report, Lumina defined quality in terms of “student outcomes, particularly learning outcomes, and not by inputs or institutional characteristics” (p. 1). The learning outcomes should clearly allow students to demonstrate key skills that would serve to enhance employability.

ESECT (Enhancing Student Employability Co-ordination Team) defines employability as “a set of achievements – skills, understandings and personal attributes – that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy” (The Pedagogy for Employability Group, 2006). However, some contend that knowledge and skills are simply not enough and that an additional focus should be placed on student experiences and opportunities to engage in measurable functions which would serve to enhance employability.

Assessment of curriculum to meet workforce needs is an idea that higher education cannot do alone. Jones and Harrington (2002) suggested that collaboration is a vital step in producing economic change through curricular reform. They emphasized the importance of a proactive approach by higher education through the creation of strategic partnerships with employers in key sectors in order to develop programs to meet 21<sup>st</sup> century workforce needs.

Once curriculum has been assessed and workforce needs identified, curriculum development can include the modification of existing courses, the development of new course offerings, and the sequential grouping of those courses to meet targeted goals (Phillips, Settoon, & Phillips, 2008). For example, in a study of undergraduate business students (Ehiyazaryan & Barraclough, 2009), curriculum was developed to improve self-efficacy and employability by integrating real-world experiences related to the area in which students might seek employment. Students engaged in activities such as contract negotiation, complex communications, and team

collaboration. The results of the study indicated strong evidence related not only to the development of transferable workplace skills, but also pointed to an increased awareness of how to articulate those skills in a resumé or future employment interview.

Howard (2007) further emphasized the importance of designing curriculum to develop real-world, transferable workplace skills for students. He outlines opportunities for the incorporation of problem-based learning activities to help students learn and to be able to apply key concepts, a skill that many employers see as lacking in their applicants. Howard went on to suggest that, although the opportunities for change exist, the work involved in identifying workforce needs and developing a coherent, problem-based curriculum to meet those needs is not easy.

### **PIECE Model**

Although various routes could be taken to develop curriculum with a partnership concept in mind, Figure 2 suggests a model for consideration. The PIECE Model (Partnering Industry and Education for Curricular Enhancement) is designed with three assumptions: the process should be simple and sustainable; the process should provide an avenue to enhance curriculum, not reinvent it; the process should begin and end with the stakeholders or partners involved in developing the curriculum.

The PIECE model is a simple model that starts with an *assessment* of the workforce environment through various stakeholders (educational institution, business and industry, local government, regional economic development/workforce education boards, chambers of commerce, students, and state/national labor statistics). This step would allow the assessment team to determine specific goals and skill sets that would benefit students and enhance employability.

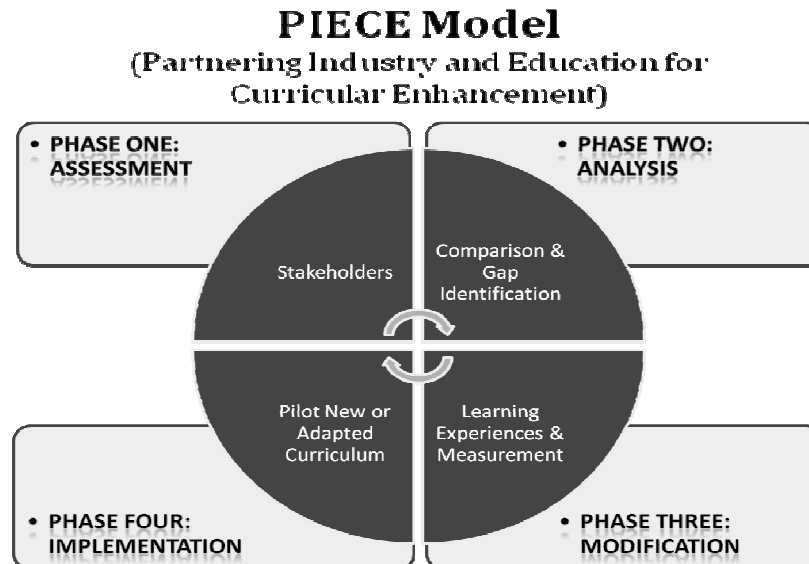
Upon completion of the assessment by stakeholders, an *analysis* would occur by comparing the identified goals and skill sets to existing curriculum to locate gaps. Although the model could be used to completely revamp an entire curriculum, the logistics associated with developing an entirely new curriculum and receiving the necessary approval to implement that curriculum may not be conducive to formulating a curricular product that can be put into place in a timely manner. Therefore, it is recommended that, while industry/education partnerships can reveal a need for a new curriculum, adding components to existing curriculum/courses would prove to be the most cost-efficient and time sensitive way to accomplish stakeholder goals.

Once the curriculum gaps have been identified, educators would then proceed to the *modification* of existing curriculum by selecting learning experiences to achieve the identified goals and skill sets. In addition, plans to measure the attainment of those goals and skill sets would be developed. It would be important to develop assessments which will measure both knowledge and application as employers have identified that employees may *know* but cannot *apply* what they know to a real-world situation (Casner-Lotto & Barrington, 2006; Glenn, 2007; National Skills Coalition, 2011).

The fourth phase of the model, *implementation*, would serve as the point of putting into practice what was established in the assessment phase, analysis phase, and modification phase. Educators would incorporate new learning experiences which were selected and designed to close the gaps identified by stakeholders as important and necessary for employability. Learning experiences would ideally involve real-world situations in order to assess a student's ability to apply what they know.

Finally, as the model represents a perpetual design, the curricular modifications and the results of student learning would then return to phase one to be assessed by stakeholders in order to determine if gaps were filled and what gaps might still exist; to identify new skill sets that may have developed since the previous assessment phase; and to continue to offer improved learning experiences to enhance employability.

Figure 2: Partnering Industry and Education for Curricular Enhancement



This collaborative curriculum development model takes into consideration the needs of various stakeholders in an effort to design the most effective learning experiences needed to close the gap between knowledge and application, or capability and competency, thus enhancing employability. To further clarify the idea of a collaborative curriculum development model, Jones and Harrington (2002) outline additional collaborative benefits which include a better understanding among constituents as to how they are affected by workforce needs and responses to those needs. In addition, they recommend that steps be taken to ensure sustainability of collaborative efforts rather than relying on a single, one-time assessment which can quickly become outdated.

### Conclusion

In the report entitled *Are They Really Ready To Work?* (Casner-Lotto & Barrington, 2006), Bill Shore, Director, U.S. Community Partners for GlaxoSmithKline offered the following challenge to other business leaders:

The numbers don't bode well for the future—the future of our workforce. It is in our interest to help solve the problem. And business has the capacity to help solve the problem by partnering with education and community leaders to create opportunities for young people to practice the skills they need to be successful. (p. 57)

Alan Greenspan (1999), former Federal Reserve Chairman also commented as to how education works together with the changing economy and how that economy impacts the workforce and graduates heading into that workforce. He discussed the necessity for continued breakthroughs in science and technology if the United States is to meet the goal of educating and preparing workers for 21<sup>st</sup> century jobs. In addition, he emphasized the important role that higher education will play in worker preparation. “With two-thirds of our high school graduates now enrolling in college and a growing proportion of adult workers seeking opportunities for retooling, our institutions of higher learning now bear the overwhelming responsibility for ensuring that our society is prepared for the demands of rapid economic change” (Greenspan, 1999, para. 21).

Greenspan (1999) continued to offer encouragement as he reflected historically on the successful educational responses to changing economies in the U.S. He gave credit to educational institutions for having the versatility and creativity to continually meet the needs of the workforce and, as a result, to continue America’s reputation as an educational and economic leader. However, since the U.S. appears to be falling behind other global competitors, one might wonder if that versatility and creativity needs a jumpstart.

In the article, *Do We Need Another Sputnik?* Bybee (2007) made the case that the U.S. response to global competition should mirror the response of the Sputnik era. He spoke of President Kennedy’s subsequent challenge to the nation to send a man to the moon and to do it by the end of the decade. The challenge was clear and one with measurable goals that could be seen when accomplished. One step to accomplishing this feat was to involve the scientific community in the expansion of curricular components to developing the students who would one day be a part of fulfilling the mission. Bybee called attention to the fact that, unlike the Sputnik era, countries with developed or developing economies are the competitors and the goal of thriving in the global economy has no clear achievement indicators or timeline. He called upon curricular reform in order to meet the new, more ambiguous challenge of leading in the global economy.

Markes (2006) commented, “Many skills lists have appeared since the 1980s and judging from current research these lists will continue to appear unless a more centrally coordinated approach to skills needs research/funding distribution is carried out” (p. 638). Recommendations by Markes included university/company partnerships to address employer needs, interaction between educational institutions to form common terminologies, and the enhancement of employability skills through real-world application.

Other recommendations included the integration of employability skills into the broader curriculum rather than developing one specific course to assist in increasing student skill level (Glenn, 2007; Gray, Emerson, & MacKay, 2005). In addition, instead of developing entirely new curriculum, the question is asked as to how instructors can modify delivery of existing course content to include the skills employers need through real-world learning experiences such as private sector collaborations and guest speakers from area employers (Gray, Emerson, & MacKay, 2005). Jones and Harrington (2002) suggest that the real challenge is “to find ways in which the curriculum can evolve to fit the special needs and interests of both the faculty and the economy” (p. 12) and to do so with practicality and expediency.

Therefore, rather than completely revamping curriculum which can be costly, time-consuming, and might only offer a temporary fix, it appears that an ongoing collaborative effort to enhance curriculum may provide a solution worth considering. Adding real-world learning

experiences to an existing curriculum which promote employability skills such as leadership, problem-solving, and communication (verbal and written) would be a good first step to addressing overall employee gaps and employer concerns. The proposed PIECE model (see Figure 2) is an attempt at providing elements necessary to complete the curriculum enhancement process in a manner that is simple, sustainable, and provides ongoing collaboration, assessment, analysis, modification, and implementation of learning experiences. Further research is needed to continue the development of collaborative efforts among key educational stakeholders and how those efforts can contribute to ongoing curricular enhancement to meet the needs of the changing workforce and to meet the educational challenges institutions are faced with in a quickly changing world.

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