EXPLORING THE ROLE(S) OF COMMUNITY COLLEGES IN ADDRESSING WICKED PROBLEMS THROUGH MULTI-STAKEHOLDER COLLABORATION:

AN ENTREPRENEURIAL APPROACH TO SUSTAINABILITY

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Dissertation Brief

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SUSTAINABLE DEVELOPMENT GOALS

SUMMARY OF KEY POINTS

- **Community Colleges Can Be Engines of Recovery**. With over 1,100 community colleges across America within a short drive of most American households, the institutions are well-suited to serve as incubators of post-COVID recovery to help communities build back better and more equitable. Scholars recommend global challenges be addressed at local levels (Hanson, 2008). The entrepreneurial programs were a critical component for achieving this goal. Wicked problems of sustainability are best described as Sustainable Development Goals (SDGs),

- **Addressing Wicked Problems is Aligned with the Community College Mission**. Findings of the study and the literature indicate that the community college mission is aligned with addressing wicked problems of sustainability (SDGs).

SUMMARY OF KEY FINDINGS

- **Role(s).** When community colleges address wicked problems of sustainability, such as poverty, hunger, economic growth, and climate change, the colleges roles include educator, strategic leader, local convener, economic development partner, and grant partner.

- **Mission Alignment.** The mission of community colleges is aligned with addressing wicked problems of sustainability (SDGs). The value created by the entrepreneurial programs served to strengthen the mission alignment, through increased access, student success, economic development partnerships, and support for local communities.

- **Summary Charts.** Two periodic tables were created to summarize the findings of the study. Each color represents a role or mission alignment described by the participants. The individual boxes represent activities within the role or value created through the entrepreneurial MSIs related to each mission theme. Elements within the two tables present opportunities to apply for issue-focused grants.

Introduction

For years, scientists, policymakers, business leaders, and entrepreneurs have warned of social, environmental, and economic risks throughout society (World Economic Forum, 2020a). In fact, the World Economic Forum (WEF) has been sounding the alarm for years, warning of increased poverty, economic inequality, infectious disease, climate change, and many other wicked problems despite efforts to mitigate their effects (Deming, 1994).

The coronavirus pandemic is an example of how a complex and interrelated wicked problem systemically impacts community colleges across the United States. A cross-reference of the COVID-19's impact in America and globally, the relevance to community colleges, and current policy challenges is provided (See appendix O). Additionally, the chart maps the Sustainable Development Goals along each issue faced by community colleges. Ayers (2015) found that the community colleges mission is influenced by political, economic, and social issues. COVID impacts all three and, therefore, will likely influence the mission in the years to come.

Dentoni and Bitzer (2015) affirmed that multi-stakeholder initiatives are an ideal model for leveraging interdependencies between partners necessary for addressing wicked challenges for three reasons: (a) the involvement of multiple partners across different sectors and domains of knowledge counteracts the uncertainty surrounding wicked problems (Bäckstrand, 2006; Selsky & Parker, 2005), (b) the deliberative conversation and negotiation are important for establishing a shared understanding (Selsky & Parker, 2005), reframing the problem, and sense-making, which addresses conflicting values (Rivera-Santos & Rufin, 2011), and (c) the collective participation often centers on moral legitimacy, rather than proven effectiveness (Scherer & Palazzo, 2011) voluntary action over rule-oriented requirements (Weber & Khademian, 2008), and flexible networks over static arrangements (Rasche, 2012), all of which align with the dynamic complexity surrounding wicked problems.

The researcher embraces solution ecosystems, which are considered "well-understood pathways for addressing these wicked problems" (Lichenstenstein & Plowman, 2009, p. 61; Zivkovic, 2017). A systemic innovation lab is a solution ecosystem for addressing wicked problems and is comprised of key features, such as: a) focusing on addressing complex problems, b) emphasizing place-based local approaches, c) enabling coherent action by diverse actors, d) involving users as co-creators, e) supporting a networked governance approach, and f) recognizing government as an enabler of change (Zivkovic, 2018, p. 349).

Research Gap

While researchers have explored the role of baccalaureate-granting institutions in addressing wicked problems of sustainability through multi-stakeholder initiatives, the role of community colleges in addressing wicked problems of sustainability through multi-stakeholder initiatives was largely unknown. Therefore, a research gap existed regarding how the mission of community colleges is aligned with addressing wicked problems of sustainability, such as poverty, inequality, hunger, homelessness, and climate change.

Research Questions

This qualitative case study aimed to answer two research questions:

(1) How do leaders of multi-stakeholder initiatives describe the role of community colleges at the intersection of entrepreneurship, economic development, and addressing wicked problems of sustainability?

(2) How do community college leaders in multi-stakeholder initiatives describe how the mission of community colleges is aligned with addressing wicked problems of sustainability?

Sampling and Inclusion

Purposive sampling was used to recruit twenty-eight participants, including thirteen program leaders of MSIs and fifteen community college MSI leaders. The program leaders have (a) addressed social, economic, and environmental wicked problems of sustainability, (b) included community colleges or trade schools as stakeholders during the program, (c) yielded impressive measurable outcomes that are documented, and (d) incorporated entrepreneurialism and/or entrepreneurial problem-solving. Data collection involved semi-structured interviews, along with a retrieval of artifacts in the form of research studies, government reports, and related websites.

Significance. The study is significant from a practical, policy, and scholarly perspective.

- Practical perspective – The study provides a strategy for community college institutions to increase their enrollment and retention. After all, the wicked problems faced by community college students, such as homelessness, hunger, and the ability to pay rent and utilities, often determine whether students can afford to enroll and/or continue to take classes (Goldrick-Rab et al., 2017). Ultimately, the associated impact on enrollment and retention may threaten the financial sustainability of the entire institution.

- Policy perspective – The study provides policymakers with a novel way to address complex challenges by viewing community colleges as incubators of social, economic, and environmental innovation and recovery. Armed with the appropriate evidence-based programs and funding in place, community colleges have the potential to rebuild a better and more equitable post-COVID America.

- Scholarly perspective – The researcher introduces wicked problems through a blended lens of complexity theory, as well as the theory of systemic innovation, building off the existing work of Zivkovic (2017). In addition, the concept of leveraging multi-stakeholder programs in partnership with community colleges to address wicked problems is virtually non-existent throughout the literature. The researcher aimed to capture examples of this intersection, which is still emergent in the literature. The World Economic Forum (2020a, 2020b) asserted that multi-stakeholder collaboration is required to address the complex problems society faces today.

Multi-Stakeholder Initiatives

In recent years, MSIs have gained popularity as a strategy for addressing complex societal problems (Fowler & Biekart, 2017). Roloff (2008) defined MSIs as organizational structures that leverage collective action beyond boundaries. Freeman (1984) described the phenomenon as "any group or individual who can affect or is affected by the approach to the issue addressed by the network" (p. 25). Although many different definitions of MSIs exist, common characteristics across all include the convening of individuals with different interests to communicate for the purposes of making a collaborative win-win decision through democratic participation (Hemmati, 2002). MSIs go by many different names, including cross-sector partnerships, multi-stakeholder collaboration, community collaborations, transdisciplinary collaborations, multi-stakeholder platforms, interorganizational collaboration, and collaborative planning (Stibbe et al., 2019). The initiatives are often seen as a viable response to the emergence of wicked problems (Palazzo & Scherer, 2008; Scherer et al., 2013; Waddock, 2013). Many researchers view the networks as a strategy for democratic participation (Habermas, 1998; Palazzo, 2002; Rhodes, 2000).

MSI Example. Strategic Doing is an example of a multi-stakeholder program addressing wicked problems of sustainability in collaboration with local community colleges. In 2004, civic leaders in North Central Indiana launched a four-year effort to transform the regional community (Hutcheson & Morrison, 2012). The Purdue Center for Regional Development (DCRC) applied for, secured, and acted as the fiscal and program lead of a $15 million grant from the U.S. Department of Labor's Employment and Training Administration (DOLETA) under the Workforce Innovations in Regional Economic Development (WIRED) grant (United States Department of Labor, 2010). Only 8% of the funding was allocated to Strategic Doing. Purdue DCRC generated 40% of the results nationally. Interestingly, the proposal did not specify how all funds would be spent but did articulate broad strategic areas and incentives for collaboration based on ideas for regional transformation (Hutcheson & Morrison, 2012). The process involved multiple stakeholders, including the local community college, gathering in civic forums to consider four questions central to the Strategic Doing process: (a) Where are we going? (b) How will we get there? (c) What could we do? (d) What should we do? (Hutcheson & Morrison, 2012).

The broad strategic areas were entrepreneurship strategy, 21st-century skills, innovation strategy, and regional civic leadership. In total, the multi-stakeholder initiative involved 40 partners, impacted 14 surrounding counties, and resulted in 60 initiatives (Hutcheson & Morrison, 2012). Impressively, 80% of the initiatives were still active in 2012, long after the funds were expended (Hutcheson & Morrison, 2012). The resulting metrics for each strategic area were reported and verified by the U.S. Department of Labor and included:

Entrepreneurship Strategy Outcomes.
The outcomes for the entrepreneurial strategy goal were:

- **1,537** existing and emerging entrepreneurs trained
- **708** new business/growth ideas developed
- **145** individuals in 11 companies using entrepreneurship to increase top-line growth

21st Century Skill Outcomes.
The outcomes associated with the 21st-century skills goal were:

- **15,042** workers trained
- **1,262** degrees or certificates awarded
- **9,534** individuals assessed for careers in advanced manufacturing
- **3,165** individuals placed in employment
- **7,593** high-school students in new STEM education programs
- **130** new college internships developed

Innovation Outcomes.
The outcomes associated with the innovation strategy goal were:

- **500** companies engaged in supply chain training
- **23** university faculty newly engaged with industry
- **150** individuals with Nanostructured Coatings Technology certificates

Regional Civic Leadership Outcomes.
The outcomes associated with the regional civic were:

- **1,304** civic leaders engaged in regional collaborations and actively engaged
- Launched a new regional leadership initiative (Hutcheson & Morrison, 2012, p. 2-4)

Global Challenges

The World Economic Forum published the 2020 Global Risk Report (World Economic Forum, 2020a). The report sounds the alarm on global issues, such as climate change and other existential risks, and calls for a multi-stakeholder approach to addressing and mitigating risk. Researchers have examined the likelihood and impact of five interconnected categories of risks, including economic, environmental, geopolitical, societal, and technological (World Economic Forum, 2020a). The focus of this report is on both a short-term and long-term perspective of these risks. According to the World Economic Forum (2020a),

The global economy is faced with a "synchronized slowdown," the past five years have been the warmest on record and cyberattacks are expected to increase this year—all while citizens protest the political and economic conditions in their countries and voice concerns about systems that exacerbate inequality. Indeed, the growing palpability of shared economic, environmental, and societal risks signals that the horizon has shortened for preventing— or even mitigating— some of the direst consequences of global risks. It is sobering that in the face of this development when the challenges before us demand immediate collective action, fractures within the global community appear to only be widening. (p. 4)

Researchers have also warned that if a lack of coordinated action continues, the risks will only increase. The Global Risks Perception Survey findings are based on the responses of 800 action-oriented business, government, and non-profit leaders and members of the forum, in addition to 200 Global Shapers, which are described as a generation of emerging global social entrepreneurs and entrepreneurial leaders (World Economic Forum, 2020a). Top risks in 2020 highlighted in the research include: (a) risks to economic stability and social cohesion, (b) heightened risks of climate change, (c) accelerated biodiversity, (d) consequences of digital fragmentation, and I health systems under new pressure. In 2021, the global risk landscape changed dramatically, due to the Coronavirus Pandemic. The top risks by likelihood were listed as (a) extreme weather, (b) climate action failure, and (c) human environmental damage. The top risks by impact were (a) infectious disease, (b) climate action failure, and (c) weapons of mass destruction (World Economic Forum (2021b).

Former U.S. Vice President Al Gore has focused on the climate crisis for 20 years and is frustrated by the neglect of this looming catastrophic issue. Recently, while speaking to Masters of Business Administration (MBA) students at Oxford University, Gore warned that "we are in the midst of a sustainability revolution that will have the magnitude of the industrial revolution and the speed of the digital revolution" (Haney & Drobac, 2020, p. 1). Later, at the Nobel Peace Prize Forum in Oslo, he asked, "Will our children ask us why we didn't act, or will they ask us how we found the courage and rallied the resources to rise up and change?" (World Economic Forum, 2019, p. 1).

Community colleges across America have a moral responsibility to participate in addressing these global challenges. More importantly, the mission of community colleges is naturally aligned with addressing wicked problems of sustainability (AACC, 2011). Community colleges across the nation are potentially a powerful force for societal impact, if mobilized and appropriately resourced.

Wicked Problems of Sustainability

Wicked problems of sustainability, such as poverty, hunger, and climate change, are common throughout society (United Nations Assembly, 2015). For this reason, the topic of addressing wicked problems has taken a prominent role in academic conversations related to sustainability (Dentoni & Bitzer, 2015). Although a growing awareness exists, researchers struggle to agree on even the definition, due to the level of complexity surrounding the concept (Batie, 2008; Van Bueren, 2003). The term was originally introduced by Rittel and Webber (1973), who expressed concern about the approach to public planning when dealing with problems of various wickedness dimensions.

Despite the disagreement over the definition of wicked problems, some consensus exists surrounding the characteristics of the phenomenon. For example, wicked problems have three similarities: they change over time (Weber & Khademian, 2008), social scientists are uncertain about their root causes due to social complexity (Lazarus, 2009), and stakeholders hold different values regarding the challenges, which often causes conflict (Conklin, 2006).

In addition, the properties of wicked problems often demand collective action across several sectors to create transformative and impactful change throughout the system (Waddock, 2013). Further, the action of individuals to combat wicked problems has very little impact without the collective and coordinated action with others, which is why multi-stakeholder initiatives play an important theoretical role in the dissertation (Batie, 2008; Conklin, 2006; Weber & Khademian, 2008).

Researchers have, however, acknowledged that "creating such mechanisms and making them work is in itself a wicked problem" (Jentoft & Chuenpagdee, 2009, p. 555). These challenges are a result of value struggles between partners (Andonova et al., 2009), cognitive limits of the actors involved (Batie, 2008), and unrealistic expectations on the part of public decision-makers demanding short-term results (Levin et al., 2012). In addition, the nature of wicked problems requires the acceptance that there are no absolute solutions or definite answers (Rittel & Webber, 1973), rather a need for goals that are on a scale of improvement.

Wicked problems have no solution, resist linear-logic models, and are not comprehensible based solely on quantitative and objective data. Researchers emphasized that wicked problems cannot be "solved" because they are unsolvable (Rittel & Webber, 1973). Conklin (2006) asserted, "you don't so much solve a wicked problem as you help stakeholders negotiate shared understanding and shared meaning about the problem and it's possible solution" (p. 4). The objective of the work is coherent action, not the final solution. According to Rittel and Webber (1973), wicked problems have ten core characteristics:

Proposition 1.	There is no definitive formulation of a wicked problem.
Proposition 2.	Wicked problems have no stopping rule.
Proposition 3.	Solutions to wicked problems are not true-or-false, but good-or-bad.
Proposition 4.	There is no immediate and ultimate test of a solution to a wicked problem.
Proposition 5.	Every solution to a wicked problem is a 'one-shot operation;' because there is no opportunity to learn by trial-and-error, every attempt counts significantly.
Proposition 6.	Wicked problems do not have an enumerable (or exhaustively desirable) set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into the plan.
Proposition 7.	Every wicked problem is essentially unique.
Proposition 8.	Every wicked problem can be considered a symptom of another problem.
Proposition 9.	The existence of a discrepancy representing a wicked problem can be explained in numerous ways. The choice of explanation determines the nature of the problem's resolution.
Proposition 10.	The planner has no right to be wrong. In other words, planners are responsible for the consequences of the actions they generate. (pp. 161–166)

According to Davies et al. (2012), traditional institutions are incapable of single-handedly addressing wicked problems. This is due to the scale, scope, and complexity of the issues across various policy domains, sectors, and political jurisdictions. Similarly, Rittel and Webber (1973) suggested:

> Approaches of the second-generation should be based on a model of planning as an argumentative process in the course of which an image of the problem and the solution emerges gradually among the participants, as a product of incessant judgment subjected to critical argument. (p. 162)

In addition, societal governance is ill-equipped to resolve wicked problems due to the linear nature of traditional methods. As such, new methods of governance are needed to address wicked issues surrounding sustainability.

Sustainable Development Goals

In response to global challenges, the United Nations launched the 2030 Agenda for Sustainable Development. The initiative is a universal agenda outlining a plan of action with the goal of stimulating action between 2015-2030, in five areas of key importance: people, planet, prosperity, peace, and partnership (United Nations Assembly, 2015). The report outlined 27 principles, 17 goals, and 169 actions for impacting economic, social, and environmental aspects of societal change. The purpose of the effort is to tackle systemic challenges, local needs, interests, and resources for transformative change using innovative approaches and long-term investments (United Nations Assembly, 2015).

The 2030 Sustainable Development Goals are considered a "blueprint for global development, which represents a fundamental shift in thinking, explicitly acknowledging the interconnectedness of prosperous business, a thriving society and a healthy environment" (Stibbe et al., 2019, para. 2). Due to the interconnected nature of the goals, researchers advocate for addressing the challenges holistically, rather than individually in isolation (Catalyst2030a, 2020). The 17 Sustainable Development (SDGs) topics each align with the description of wicked problems re-positioned as goals.

Departments within universities often address wicked problems of sustainability when mandated by accreditation bodies, such as the Association to Advance Collegiate Schools of Business (AACSB). AACSB is the global gold standard in university-level business school accreditation with more than 877 business schools accredited and 276 schools in progress (personal communication, February 22, 2021). In 2020, the organization's new accreditation standards were approved and notably, now require business schools to be a force for good in society. One of the new standards, Standard 9, requires business schools to demonstrate a commitment to making the world better as evidenced through the business school's strategic plan, curriculum, research and action-orientation. According to the Chief Accreditation Officer, Dr. Stephanie Bryant (personal communication, February 22, 2021), "the power is not in one school, although one school can do good work. The power is all of our schools together". She believes the future of education is through interdisciplinary partnerships. This is an example of how accreditation can systemically influence departments within universities (or community colleges) to address wicked problems while incorporating the SDG framework.

Literature Review

Theoretical Research

The literature indicates traditional methods of problem-solving are inadequate for addressing wicked problems (Zivkovic, 2017). Rather, Zivkovic (2017) advocated for the more holistic blended approach of systemic innovation and complexity science when addressing wicked problems. Complexity science involves the interactions between small actions that lead to large-scale effects within a given situation due to complex and multi-dimensional interconnectedness (Phelan, 2001). According to Zivkovic, "no single unifying theory of complexity exists" (p. 2). Rather, the concept is comprised of shared ideas across interrelated research, including systems thinking and complex adaptive systems, which is the most basic unit of analysis in complexity science (Uhl-Bien et al., 2008). The literature review is primarily based on two theoretical pillars: the theory of complex adaptive systems and the theory of systemic innovation.

1. Theory of Systemic Innovation

Theory of Systemic Innovation. Davies et al. (2012) asserted that systemic innovation is the preferred style of social innovation when addressing wicked problems, as the approach incorporates concepts surrounding complexity science, including complex adaptive systems. Systemic innovation is defined as "a set of interconnected innovations where each is dependent on the other, with innovation both in the parts of the system and in the way they interact" (Davies et al., 2012, p. 4). Notably, the goal of systemic innovation is to maximize the value of social innovation by improving outcomes, such as higher graduation rates or lower unemployment (Davies et al., 2012). In fact, emerging strategies for complex issues focus on (a) outcomes, rather than inputs and outputs, (b) qualitatively measurable and demonstratable results, (c) cross-sector collaboration and co-ordination across boundaries, (d) co-creation of solutions with users directly affected, I self-organization is de-centralized through increased community decision-making powers, (f) increased adaptive capacity, and (g) adoption of new continuous improvement methods and learning organizations through reflective practice (Schön, 1983). The strategy is complex and challenging as it requires change in behavior, structure, and process and cross-sector involvement across business, government, civil society, and households (Davies et al., 2012).

According to Davies et al. (2012), wicked problems can be better addressed through systems innovation when practitioners understand the concepts surrounding complexity and complex adaptive systems. In addition, enabling conditions are a prerequisite for bringing systemic change (McKelvey & Litchtenstein, 2007), and these conditions should be catalyzed by governmental entities (Bentley & Wilsdon, 2003). Davies argued that in order to be truly transformational, systemic innovation will require several of the following elements: (a) development following a crisis or period of upheaval, (b) new ideas, concepts, and paradigms, (c) new laws and/or regulations, (d) coalitions for change of many actors across more than one sector and scale, I changed market metrics or measurement tool, (f) changed power relationships and new types of power structures, (g) new skills or roles across many actors, and (h) new institutions, and widespread changes in behavior, structure, and/or processes. Finally, experts advocate for human-centered, holistic, cross-silo, and multi-stakeholder approaches when addressing wicked problems, such as the SDGs (Catalyst2030a, 2020).

When addressing wicked problems within complex adaptive systems Zivkovic (2018) advocates for the use of a systemic innovation lab, which is a complexity-science informed solution ecosystem. Systemic innovation labs possess certain key features, including a) focusing on addressing complex problems, b) emphasizing place-based local approaches, c) enabling coherent action by diverse actors, d) involving users as co-creators, e) supporting a networked governance approach, and f) recognizing government as an enabler of change (Zivkovic, 2018, p. 349). Additionally, systemic innovation labs often shift between macro, meso, and micro levels of analysis and action, due to the systemic design nature of the work. In this context, design is defined as, "the ability to imagine that which does not yet exist to make it appear in concrete form as a new, purposeful addition to the real world" (Nelson & Stolterman, 2012, p. 12). Systemic design is a next-generation practice characterized by a set of core principles including: compelling collective action toward a desirable outcome, appreciating complexity, purpose-finding, boundary framing, feedback coordination, system ordering, generative emergence, continuous adaption, self-organizing and requisite variety (Jones, 2014, p. 106). Finally, leaders within systemic innovation labs often adopt the complex systems leadership style of "generative leadership", which emphasizes the need for goal alignment and understanding collective goals prior to advancing action in order to stay aligned (Surie & Hazy, 2006, p. 17).

2. Theory of Complex Adaptive Systems

Complexity is defined as, "the formation and reformation of patterns and structures whether in companies, research, and development teams, communities, or cities and nations" (Brett, 2019, p. 19). The concept includes several related theories, such as self-organization, collective behavior, networks, adaption and evolution, pattern recognition, systems theory, and non-linear systems. Figure 2 represents a holistic view of the theory of complexity and related complex adaptive system (CAS; Uhl-Bien et al., 2008).

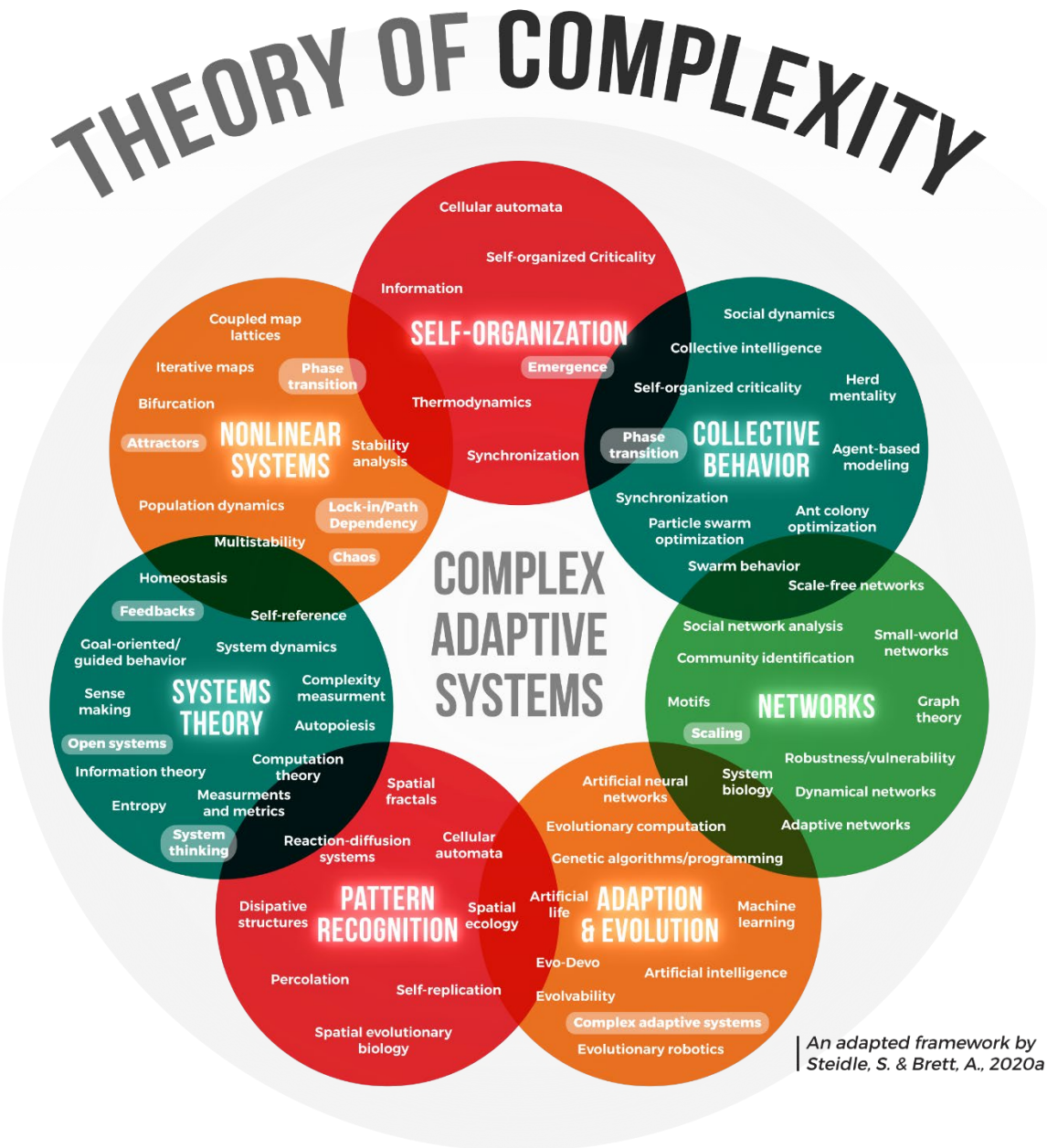
The most basic unit of analysis in complexity science is the CAS (Uhl-Bien et al., 2008). CASs are individuals, agents, or groups (Lichtenstein & Plowman, 2009; Uhl-Bien et al., 2008) that are open, non-linear systems and often adapt or evolve as needed (Merali, 2006). A complex adaptive system is also defined as:

> Collections of many different components (agents) interacting in nonlinear ways in the absence of any external supervisory influence. The behaviors of a complex adaptive system cannot be explained by the behavior of specific agents (reductionism); instead, complex adaptive systems show emergent behavior (Sturmberg et al., 2014, p. 66).

The theory of complex adaptive systems is highly recommended when addressing wicked problems (Elia & Margherita, 2018), as they consider interdependencies and the ever-changing nature of wicked problems (Australian Public Service Commission, 2007). Researchers have outlined several key concepts surrounding complexity science to explain the dynamics of complex adaptive systems when experiencing systemic change (Clancy et al., 2008; Holland, 1995; Kauffman, 1993; Zivkovic, 2017, p. 239).

- **Interconnecting agents** involve a characteristic, individual, organization, or decision-making entity in a complex adaptive system that adapts over time (Hazy et al., 2007, p. 5).
- **Non-linearity** is the behavior most common in complex adaptive systems in which small inputs may result in exponential change, as opposed to a typical cause and effect relationship (Zivkovic, 2017).
- **Feedback loops** are pathways of information in a cause-and-effect loop leading to changes in the complex adaptive system.
- **Self-organization** is the recombination of new patterns impacting the performance of complex adaptive systems (Lichtenstein & Plowman, 2009).
- **Emergence** encompasses characteristics of the whole system that cannot be explained by individuals within the complex adaptive systems.
- **Phase transitions** are the tipping points of change for impacting the wicked problem (Van Wezemael, 2012, p. 100).
- **Attractors** are sets of beliefs, actions, and results that represent stable patterns and typical behavior (Svyantek & Brown, 2000).
- **Lock-in and path dependency** is the tendency to stick with sub-optimal patterns of opportunity, despite better options available (Unruh, 2000).
- **Edge of chaos** is a requirement for solving complex problems, which consist of heightened uncertainty, interconnectedness, and interdependency (Waldrop, 1992, p. 313).
- **Solution ecosystems** are now considered a well-understood pathway for addressing wicked problems (Lichtenstein & Plowman, 2009, p. 61).
- **Turbulence** is chaotic and random behavior (Clancy et al., 2008).
- **Adaptation** is "the changes made by agents in response to the actions of other participants, environmental conditions or emergent systems. It is generally conceived of as features of the goal-seeking behavior of agents in a complex adaptive system" (Ansell & Torfing, 2016, p. 366; Holland, 1995; Kauffman, 1993).
- **Open strategy** is described as a dynamic bundle of practices that afford internal and external actors' greater strategic transparency and/or inclusion that balance and the extent to which they respond to evolving contingencies desired from both within and outside organizational boundaries (Hautz et al., 2017, p. 298).
- **Collective impact** encourages interconnected initiatives to support cross-sector collaborations for progress in addressing wicked problems. The concept also recognizes complexity, as emergence is a factor in complexity science, which is defined as "events that are unpredictable and seem to result from interactions between elements and which no one organization or individual can control" (Kania & Kramer, 2013, p. 3).

According to Lichtenstein and Plowman (2009), disrupting the interconnections of agents is initiated by emergence, ultimately pushing the system to the edge of chaos. Disrupting the system is paramount because a state of disequilibrium allows the production of a new system-level order. A disrupted system provides a sensitive state in which small changes through action and events can quickly spread through the system, overcoming lock-in and transitioning toward new actor regimes (Goldstein, 1994; Zivkovic, 2017).



Literature Research

1. Multi-Stakeholder Initiatives for Wicked Problems

Carcasson (2013) outlined three coping strategies for addressing wicked problems through MSIs. They include expert (authoritative), adversarial (competitive), and deliberative (collaborative) strategies. Distinguishing between the three strategies is important since each strategy is accompanied by benefits, drawbacks, and varying levels of effectiveness (Roberts, 2000).

Expert (Authoritative) Strategies. Expert (authoritative) strategies involve placing decision-making authority in the hands of a few stakeholders (Roberts, 2000). Using these strategies, an emphasis is placed on organizational hierarchy, coercive power, and access to information with top authorities defining the problem and proposing a solution. Although such strategies offer a simplistic, rather than complex approach, they can lead to decreased legitimacy and less acceptance. In addition, Roberts (2000) warned, "authorities and experts can be wrong – wrong about the problem and wrong about the solution" (p. 4). Innes and Booher (2016) asserted that traditional planning expert-driven approaches based on scientific considerations are not well-suited for addressing wicked problems.

Adversarial (Competitive) Strategies. Adversarial (competitive) strategies involve some individuals winning while others losing (Roberts, 2000). According to Roberts (2000), central to competitive strategies is the search for power and therefore, may lead to the use of authoritative strategies. Although the zero-sum strategy is efficient, potential partners are often alienated (Theis, 2016). This type of strategy can lead to an over and unequal consumption of resources, with some feeling left out (Roberts, 2000). If pushed to the extreme, these strategies can lead to violence, warfare, stalemates, and policy gridlock (Kagan, 1991; Pfeffer, 1992; Shilts, 1987). While the 'zero-sum game' aims to distribute pieces of the pie based on winning or losing, deliberative or collaborative strategies strive to enlarge the pie (Roberts, 2000). For this reason, the literature pertaining to MSIs focuses on deliberative and collaborative strategies.

Deliberative and Collaborative Strategies. Deliberative (or collaborative) strategies involve adopting a win-win mentality in which stakeholders participate in the dialogue with the goal of reaching a consensus (Roberts, 2000). Roberts (2000) defined collaboration as a strategy acknowledging that "by joining forces parties can accomplish more as a collective than they can achieve by acting as independent agents" (p. 6). Additionally, adopting a win-win mindset is most effective when problem-solving is the core of collaboration. Where collaborative (or deliberative) solutions are implemented, there is often widespread acceptance and legitimacy (Carcasson, 2013). Admittedly, more resources are required on the front end, and fewer resources are needed during the implementation process (Roberts, 2000).

Peer and Stoeglehner (2013) employed a multiple-case study approach to explore opportunities for universities to contribute to local and regional sustainability efforts. In their study, the researcher advocated for a collaborative rational planning process aligned with both Habermas's concept of communicative rationality and Rittel and Webber's second-generation systems approach. With collaborative dialogue, participants emphasized deliberation and were more willing to back off rigid positions in lieu of alternative pathways to further their interests while enlarging the pie for the benefit of everyone involved and learning new ways of solving problems (Innes & Booher, 2016). According to Innes and Booher (2016), the collaborative process is rational when the initiative meets seven conditions:

(a) participants are diverse in terms of their views on the issue at hand;
(b) the focus is on problems that involve shared interests of the group;
(c) interests are articulated by the participants early, but they are encouraged to hold back advocacy;
(d) face-to-face conversations are held for the purpose of authentic dialogue;
(e) the dialogue involves both expert and community knowledge;

(f) out of the box thinking is encouraged and often helps to reframe the problem; and
(g) the group aims to satisfy the significant concerns of each participant.

Admittedly, both collaborative and communicative methods of planning are constrained by the fact that consensus is typically unlikely.

Carasson (2013) viewed deliberative engagement as the ideal mechanism for decision-making among individuals with shared goals. When practicing deliberative democracy,

> Citizens come together and consider the relevant facts and values from multiple points of view, listen and react to one another. The goal is to think critically about the various options and work through the underlying tensions and tough choices inherent in wicked problems. (p. 41)

Community colleges are often viewed as "democracy colleges" (Theis & Forhan, 2017); therefore, the strategy of deliberative dialogue is a natural fit for the institutional culture.

The role of universities differs between rational and collaborative or communicative planning. According to Peer and Stoeglehner (2013), rational planning views the university's role as a provider of education and expert opinions, while the collaborative or communicative model encourages university employees to bring factual knowledge, values, and paradigms to influence toward sustainability and essentially act as a "change agent".

Creative Problem-Solving- A Deliberative Technique. According to Mumford et al. (1991, 2003), traditional problem-solving is insufficient for solving ill-defined, wicked problems because wicked problems require creative thinking. One deliberative technique is creative problem-solving (CPS), which is one of the most widely taught methods for addressing hard-to-solve challenges (Puccio et al., 2012; Treffinger & Isaksen, 2005). CPS is defined as a deliberate process designed to stimulate creative thinking and to address ill-defined problems using creative cognition (Puccio et al., 2012). Creative cognition enables individuals to connect ideas and to collaborate with others to creatively address problems in uncertain situations (Mumford et al., 2003).

Creative problem-solving leverages both divergent and convergent thinking (Puccio et al., 2012, p. 74). Divergence is a process of exploration, seeking new ideas, and connecting seemingly unrelated concepts to spontaneously generate novel ideas (Torrance, 1972, 1978, 1988). Convergence is a process that uses analytical skills to evaluate ideas in a more orderly way (Sternberg, 2006, 2010; Sternberg & Lubart, 1991, 1992).

2. The Role of Higher Education in Addressing Wicked Problems

Researchers have called for academics to reflect on their responsibility in society (Ferrer-Balas et al., 2010), and the university's role in addressing wicked problems (Manring, 2014), both of which often fit the objectives of the institution (Trencher et al., 2014). While some researchers have asserted that higher education institutions serve a public purpose, and therefore, should contribute to solving societal problems (Shapiro, 2005), the issue has been debated for years.

Trencher et al. (2014) offered important insights through a comprehensive global study of cross-sector university collaborations for sustainability. The macro-level empirical analysis was based on 27 partnerships across Asia, Europe, the Middle East, and North America. In the study, researchers documented the characteristics, processes, outcomes, challenges, and roles held by the universities. Researchers identified six possible roles, including (a) inventor/innovator, which focuses on creation and demonstration of ideas, pilot projects, and supporting technology, green, and/or social entrepreneurs; (b) revivalist/retrofitter, which is a collaborator with external developers to improve existing buildings and spaced with consideration for the local socio-economic fabric; (c) builder/developer, which is based on new development, renovation, and/or construction through either endowment, public, and private funds for key industry-cluster initiatives; (d) directors/linkers bring to life the grand vision established by university actors through leveraging partner resources, mobilizing other actors, and establishing networks for increased intelligence and guidance; (e) scientific advisors/communicators take a passive role aiming to influence local governance, communicate results of a pilot through creating a blueprint, master plan or report; and/or (f) facilitator/empowerer also takes a passive role with the goal of unleashing, rather than imposing change by empowering community stakeholders to self-realize transformation through self-diagnosing problems.

Zilahy and Huisingh (2009) employed a qualitative questionnaire and review of the literature to identify the roles in academic, regional sustainability initiatives. Arbo and Bennworth (2007) proposed four ways universities can contribute, including (a) installing energy efficiency throughout the institution's management practices; (b) providing technical expertise surrounding multi-disciplinary issues, such as climate change; (c) instilling employability skills required for a well-functioning democracy, such as critical thinking skills; and (d) establish a leadership role with local authorities and other stakeholders throughout society when addressing sustainability issues.

Devine-Wright et al. (2001) described five roles higher education institutions can perform in multi-stakeholder networks, which include (a) acting as prime movers to create strategy and tactics, provide resources, guide action, and allocate resources; (b) act as the gatekeepers for network access; (c) act as the spokesmen for the network; (d) participate as a bridge institution for the various partners; and I independently monitor and measure performance and mapping. Stephens et al. (2008) advocated for universities to act as changemakers across various cultures and contexts by (a) offering a model for sustainable practices; (b) teaching students concepts surrounding complexity science for sustainability, such as integration, synthesis, and systems thinking; (c) participate in real-world impact through research and other activities; and (d) encourage transdisciplinary engagement between institutions and individuals, both internal and external to higher education and other societal institutions. Calder and Clugston (2003) analyzed data surrounding the sustainability performance of universities in the United States. The eight dimensions used in the study were based on curricula, research, faculty and staff hiring, development and rewards, operations, student opportunities, outreach and service, institutional mission, structure, and planning. The findings showed that efforts to connect universities and colleges to the surrounding communities "may represent the most significant single development in the advancement of HESD (higher education sustainable development) since it indicates a growing critical mass of institutions within certain regions committed to changing state policy in support of sustainability" (p. 638). The contribution of education and training activities far outweighed the frequency of outreach activities.

Dentoni and Bitzer (2015) identified five mission-centric roles that academics play when participating in MSIs. Dentoni and Bitzer suggested that "the roles of academics in MSIs have the potential to make a significant contribution to advancing organizational goals of universities, such as high-quality research and enhancing the universities' roles in sustainability" (p. 76).

3. Community College Mission Alignment

Community colleges across the United States serve nearly 6.5 million students annually, approximately 46% of America's undergraduates (Labov, 2012). These institutions educate a significantly more diverse student population than 4-year universities within the same geographic location. Among all enrolled undergraduates in the United States, 47% of African Americans, 47% of Asians, 55% of Hispanics, and 57% of Native Americans are enrolled in community colleges (Labov, 2012). Additionally, community colleges serve students who have been "the most excluded from participatory democracy and political decision making" (AACU, 2020), including students who are first-generation, from underserved racial and ethnic groups, and low-income communities (Robinson, 2020, para 2). Community college students often experience a "civic empowerment gap, which prevents engagement in civic learning and participatory democracy (Levinson, 2010).

According to Boggs (2010), community colleges typically serve multiple missions. While some colleges fulfill the more traditional role of educating recent high school graduates, other colleges emphasize the relationships with businesses, government, and community needs, such as retraining displaced workers and educating to fill workforce gaps (Labov, 2012). Additionally, colleges educate K-12 teachers, STEM students, and tradesmen. A majority of community colleges fulfill a blend of each mission component (Labov, 2012).

Vaughan (1997) acknowledged that the tensions leaders often experience with community college mission statements are caused by the "seemingly endless series of social, political, economic, technological, and cultural events" (pp. 41–42). Ayers (2015) stressed the importance of considering institutional priorities within the context of the global political economy considering power, asymmetries, ideologies, and injustice factors. These global and interconnected issues are central to addressing wicked problems, which will require MSIs.

Ayers (2015) reviewed 1,009 community college mission statements from 2012-2013 to 427 mission statements from 2004 using discourse analysis. According to Ayers (2015), community college leaders "use the mission statement to establish a collective sense of purpose and to guide planning" (p. 9). Mission statements help leaders make sense of the community college's role in complex issues, such as globalization, inequality, technological revolution, and decreased state funding (Ayers, 2015). The statement also serves as a public relations document, management strategy, and tool for sense-making. According to Ayers (2015, 2017), community colleges' mission statements emphasize (a) sustainability, (b) economic and workforce development, (c) student success, (d) local community, and (e) access.

› Alignment with Educating for Sustainability

Ayers (2015) emphasized the presence of sustainability, which has "emerged as a significantly more prominent term in the 2012-2013 mission statements" (p. 204). The term 'sustainable' refers to broad efforts toward financial and environmental sustainability while also acknowledging the important role of practice and curriculum (McGhee & Grant, 2016). Ayers (2015) explained that the concept of "sustainable practices" may "become a defining characteristic of legitimate institutions" (p. 205). The terms "society," "change," "technological", "diverse," "democratic," "opportunity," and "global" were found to be less prominent when comparing mission statements of 2012-2013 versus 2004 (Ayers, 2015).

While skeptics warn of mission-drift, it is important to note the community college mission explicitly includes issues of sustainability (AACC, 2011). According to the AACC (2011), "sustainability is rooted in our mission and community colleges connect with tens of millions of people who will be the sustainability leaders of tomorrow" (p. 1). These institutions face increasing pressure to both adopt sustainable strategies and lead change for organizations in the community (AACC, 2011; White & Cohen, 2014). Institutional missions are influenced by shifting forces of political, economic, and social issues and, therefore, adapt to the needs of society (Ayers, 2015). These documents are designed to reflect the college's aspirations and strategies. This section evaluates how community college mission statements align with community colleges addressing wicked problems.

The American College and University Presidents' Climate Commitment (Sustainable Development Goals, 2020) is a high-visibility agreement signed by a network of 700 colleges and university presidents, representing 6 million students. By signing the commitment, these leaders commit to addressing global climate challenges through comprehensive planning for sustainability. The over-arching organization's mission is to "accelerate progress towards climate neutrality and sustainability by empowering the higher education sector to educate students, create solutions and provide leadership-by-example for the rest of society" (Sustainable Development Goals, 2020, p. 1).

Addressing the wicked challenges described will require colleges to be ambidextrous, meaning they must be able to reflect backward, while also looking forward (O'Reilly & Tushman, 2004). Research indicates that ambidexterity strengthens the ability to serve a dual mission of educating students, while also collaborating with employers to advance regional economic development (Salomon-Fernandez, 2019).

› Alignment with Economic and Workforce Development

According to Labov (2012), community colleges aim to fulfill multiple missions. In addition to educating students, community colleges are also known for responding to community needs quickly, which is made possible through strong existing relationships with local community organizations, businesses, and governments. The College Board's National Commission on Community Colleges (2008, p. 5) described community colleges as "the nation's overlooked asset" thanks to their ability to retrain displaced workers and serve the community during turbulent times. For this reason, community colleges are critical allies for economic and workforce development.

In fact, economic and workforce development is considered an "institutional feature" of community colleges (Mars, 2013, p. 218), which strengthens their political influence. A longitudinal study across 44 states, involving 2000 rural counties reported job growth rates were significantly higher in areas with community colleges versus areas without (Crookston & Hooks, 2012). Researchers explain, however, "a mission of supporting economic development is different from supporting economically disadvantaged individuals who need benefits, such as steady employment, a diversified economy, a living wage, and employer benefits" (Williams & Nourie-Manuele, 2018, p. 17). While this may be true, the ability for economically disadvantaged community college students to be successful often hinges on overcoming non-academic barriers.

› Alignment with Student Success

Traditionally, student success metrics were based on the bottom-line numbers of retention and completion (Goldrick-Rab, 2010). According to Hearn (2006), traditional student success models "neglect key relationships between societal structure and stratification process, state and federal politics, policy implementation and student outcomes" (p. 441). Goldrick-Rab (2010) agreed that student success is "affected not only by policies that are explicitly intended to influence educational outcomes in particular but also by social policies" (p. 446). More recently, researchers have acknowledged the non-academic barriers students face that impact the student's academic success (Waters-Bailey et al., 2019; Goldrick-Rab, 2010). Walters-Bailey et al. (2019) described non-academic barriers as housing insecurity, food insecurity, lack of transportation, dependable childcare, and robust mental health services.

Williams and Nourie-Manuele (2018) analyzed the missions and visions of 200 community and technical colleges across nine states using the Integrated Postsecondary Educational Data System (IPEDS). The goal of the analysis was to determine whether mission statements reveal topics such as poverty, homelessness, and hunger. Although none of the mission statements included the words "poor," "poverty," or "impoverished," there were mentions of "economically disadvantaged," "socio-economic mobility," "barriers," and "obstacles". Goldrick-Rab et al. (2017) have called for community colleges to include poverty more explicitly in mission statements because of the high rates of community college students facing hunger and homelessness.

A 2017 Joint Legislative Audit and Review Commission (JLARC) report documented the operational performance of the Virginia Community College System (JLARC, 2017). In the report, certain student segments were identified as having a higher likelihood of non-completion, including first-generation and low-income students, and racial or ethnic minorities. However, the report's authors did not offer any actionable strategies for remedying the poor student outcomes but did recommend that the community college system develop a strategic plan to identify student challenges and recommend actions (recommendation 6).

› Alignment with Local Community

Supporting the local community is widely viewed as core to the community college mission (Ayers, 2015; 2017). In fact, colleges attempting to move toward a focus on globalization have met substantial resistance (Goldrick-Rab, 2010). Critics believe community colleges serve the public interest best by tackling problems that relate to their local area (Hanson, 2008). Researchers also emphasize that global sustainability impact requires local action (ExpertInnengruppe LA21, 2010). By supporting efforts to localize the Sustainable Development Goals, broader global goals are also supported. In addition, addressing wicked problems, such as poverty and unemployment, also requires coordinated action and partnership between academic institutions and the local community (Williams & Nourie-Manuele, 2018).

› Alignment with Access

The open access mission of community colleges is "intended to democratize opportunities" for all students (Goldrick-Rab, 2010, p. 437). In fact, the Brookings Institute described post-secondary education as, "the gateway to the American Dream" (Reeves & Sawhill, 2021, p. 15). However, the promise is not on track to be fulfilled due to a trend of less upward mobility in America. According to Reeves and Sawhill (2021), 90% of Americans born in 1940 are now richer than their parents, compared 50% born in 1980. 66% of the decline in mobility is a result of increased inequality (Reeves & Sawhill, 2021).

Unfortunately, socio-economic status remains correlated with completion (Goldrick-Rab, 2010). While the traditional word "access" in a community college setting means access to higher education, researchers argue that access also involves accessibility to financial aid, a source of income, basic needs, academic preparation, information, technology, childcare, food, transportation, and career pathways (Goldrick-Rab, 2010; Salomon-Fernandez, 2019). Simply promoting "access to education" without acknowledging systemic barriers that exist ignores the inequities that exist in America. The open access mission will cease to exist without an acknowledgement of the barriers and an attempt to address underlying root causes (Goldrick-Rab, 2010). According to Goldrick-Rab et al. (2017), "the living expenses associated with productive enrollment in higher education constitute substantial barriers for many community college students" (p. 14). Only by tackling these barriers, which are also considered wicked problems, will community college students truly have access to higher education.

Rural community colleges were considered as an integral part of their communities (Salomon-Fernandez, 2019). However, the ability for community colleges to meet local needs heavily depends on support from policymakers (Melguizo & Whitham, 2018). In addition to funding support, policymakers need to understand the critical role that reducing and eliminating barriers through policy plays in achieving their desired outcomes (Melguizo & Whitham, 2018). For example, 50% of residents in rural communities, compared to 7% of urban residents, lack broadband internet access (Anderson & Horrigan, 2017). If the policymaker's goal is access to education, decreasing the barriers to broadband internet through policy change is critical.

Gumport (2003) acknowledged academic institutions are often torn between two different logical expectations, both internally and externally. The first focuses on an industrial logic perspective centered on financial and strategic business decisions, while the second approach is based on social, institutional logic, which involves promoting social mobility and critical thinking. These two perspectives offer different foundations for legitimacy, opportunities, and challenges. Gumport (2003) asserted, "there is uncertainty over which organizational priorities and practices to pursue, given multiple external pressures" (p. 41).

› Alignment with Rural Community Colleges

Of the 1,666 U.S. community colleges, 922 (55%) are classified as rural two-year colleges (Hardy & Katsinas, 2007). Within and beyond these rural communities, an implicit social contract exists between community colleges and America to ensure citizens are knowledgeable and adequately prepared to fill workforce demands (Heelan & Mellow, 2017). The social contract has become increasingly tied to social justice as the middle class across America declines (Newport, 2016). Community college pathways often serve as a ladder of equity for low-income learners and displaced workers (Heelan & Mellow, 2017). However, rural community colleges have been acutely impacted by increasingly tight budgets, primarily due to decreased state investment, decreased enrollment, and a lack of internet and computers (Rush-Marlow, 2021, p. 1). According to a 2021 report by the Association of Community College Trustees (ACCT), the COVID19 pandemic has "deepened the prosperity gap between rural and non-rural communities," leaving "rural community colleges struggling to dig their students out of an ever-deepening ditch" (Rush-Marlow, 2021, p. 1). The post-pandemic reality in rural communities is a social justice issue according to several researchers (Bradley, Werth, & Hastings et al., 2012; Vergés, 2010,).

Accurately defining the issues surrounding social justice is increasingly dependent on contextual considerations (Vergés, 2010). In rural areas, the barriers to social justice revolve around scarce resources, high rates of poverty, lack of mental health resources (Campbell, Richie, & Hargrove, 2003; Wagenfield, 2003), higher rates of suicide (Roberts, Battaglia, & Epstein, 1999), alcohol abuse, chronic illness (Wagenfield, 2003) and the stigmatization surrounding mental health issues (Larson & Corrigan, 2010; Stamm et al., 2003). In addition, maintaining confidentiality is more challenging in rural communities due to the informal communication patterns common in small rural areas (Roberts et al., 1999). Rural residents experiencing the barriers described are desperately in need of social justice advocacy, as well (Bradley, Werth, & Hastings, 2012).

Murphy (2006) documented inequity in rural communities by analyzing grants provided by the top 1000 foundations in the United States. Despite the fact that "rural America accounts for 17 percent of the nation's population and 28 percent of those who live in poverty, grants to rural America accounted for only 6.8 percent of overall annual giving by foundations (Murphy, 2006). Delgado (2005) argues that poverty is impacted by not only race but also place. Transforming the system of structural inequity will require contextual policy change designed for rural communities.

The wicked problem of opioid addiction and fatalities is concerning in rural communities. According to the Center for Disease Control and Prevention (CDC), the opioid epidemic is especially hard hit in the rural communities of Central Appalachia, which includes West Virginia, Southwest Virginia, Eastern Kentucky, Southeast Ohio, East Tennessee, and North Carolina (Centers for Disease Control and Prevention, 2011).

Another wicked problem common in rural communities is stagnant or declining economic growth. In a recent report by the International Economic Development Council (IEDC), entrepreneurship was cited as a growing area of focus for rural community colleges. According to the report, cultivating small businesses is viewed as an opportunity to revitalize downtown districts and to diversify the community's economic base (IEDC, 2017). Entrepreneurial programs take various shapes, from competitions, traditional entrepreneurial degrees, and certificates to virtual and brick-and-mortar business incubation, acceleration, and coworking spaces. In 2013, The National Association of Community College Entrepreneurship (NACCE) partnered with the Appalachian Regional Commission (ARC) to promote the entrepreneurial efforts of community colleges in Kentucky, Tennessee, and West Virginia (IEDC, 2017).

Rural community colleges would benefit a great deal from addressing these wicked problems, as addressing wicked problems is often accompanied by issue-focused funding. According to the SDGFunders (2021) dashboard, SDG-focused funding was estimated at approximately $84 billion for SDG#4, education for sustainability, in 2016 alone (see Appendix S). There are 16 other issue-focused goals tied to funding, which present community colleges with new opportunities for fundraising.

4. Entrepreneurship for Addressing Wicked Problems

Entrepreneurs across the world often bear the responsibility for creatively solving problems and generating economic growth (Cooper et al., 2004; Kauffman, 2005; Johansen, 2009; Lin & Nabergoj, 2014; Kuttim et al., 2014; Nasr & Boujelbene). Similarly, entrepreneurship is widely recognized as a catalyst for addressing wicked problems of economic, social, and environmental sustainability (United Nations Conference on Trade and Development [UNCTAD], 2017). In UNCTAD's (2017) report, titled Entrepreneurship for Sustainable Development, the ways in which entrepreneurship contributes to achieving the SDGs are outlined. According to UNCTAD (2017), economic entrepreneurship, entrepreneurship education, entrepreneurial mindset, social entrepreneurship, entrepreneurial ecosystems, and sustainable entrepreneurship each play an important role in addressing wicked problems of sustainability. In this section, each topic is explained to connect the concepts of entrepreneurship with addressing wicked problems of sustainability.

Defining Entrepreneurship

The definition of entrepreneurship is widely debated. In fact, according to Lewis (2007), "sixty years of research is yet to produce widespread agreement on how to define entrepreneurship" (p. 2). More than one hundred different definitions exist (OECD Guiding Framework for Entrepreneurial Universities, 2012). The ambiguity is often a result of the concept traveling "between sectors, organizations, and actors" involving a "complex process of translation" (Ruskovaara et al., 2012, p. 2). While some researchers define entrepreneurship as new venture creation, others advocate for a broader definition involving value creation (Bridge, 2017). For example, Mishra and Zachary (2014) define entrepreneurship as a "process of value creation" leveraged in an uncertain environment (p. 251). Similarly, Bill Aulet, managing director of the Martin Trust Center at MIT, explains that people often believe "entrepreneurship is strictly associated with startups; that's not how we look at it" (Somers, M., 2018). Aulet added, "We believe that entrepreneurship is a way of creating value" both as an entrepreneur or as an employee.

Bridge (2017) warns the lack of clarity can be quite problematic due to misaligned expectations of funders, providers, and students regarding entrepreneurship education, potentially leading to disappointment for some. In an academic setting, the course outcomes may be misaligned with a borrowed curriculum. In a funding scenario, the grantor may expect job creation outcomes, while the grantee designs the application around building entrepreneurial competencies for employability.

The current study provides examples of programmatic value creation related to economic, social, and environmental outcomes. Therefore, the current study will adopt a broader definition of entrepreneurship through the lens of value creation. In the broader sense, "entrepreneurship often involves the self-directed pursuit of opportunities to create value for others. By creating value for others, individuals empower themselves" (G. Schoeniger, personal communication, July 15, 2020). According to Feld and Hathaway (2020), "while ideas may be the wellspring of economic potential, entrepreneurs are [also] the change-agents that bring that potential into reality, resulting in a wide variation in business performance and value creation" p. 25).

4. Entrepreneurship for Addressing Wicked Problems *(Cont.)*

Entrepreneurial Economy

Entrepreneurship is often viewed as an economic growth and jobs issue, which is considered a wicked problem and included in the SDGs. John Dearie (2021), Founder of the Center for American Entrepreneurship, offered important insight into why entrepreneurship is critical to economic growth, during a recent interview. According to Dearie (2021), new businesses account for nearly all net new job creation, while established larger businesses are more likely to shed jobs. This assertion was based on years of his research, along with the studies of others.

Haltiwanger (2010) analyzed more than 70 million business establishments across America, using the Census and other government data, to determine whether small, large or young businesses created more jobs. Interestingly, the researcher found (a) new businesses disproportionately account for innovation in America and (b) as existing businesses focus on increasing efficiency through technology, the aggregate effect is a decline in jobs, shedding 1 million jobs annually on a net basis.

Nobel Prize winner Robert Solow (1988) explained that innovation is the driving force of job growth. Taken together, new businesses lead to innovation and ultimately, job growth. Dearie (2021) agreed, stating, "If it were not for businesses younger than five years old, the jobs base in this country would actually shrink. New businesses are the principal source of innovation, which drives economic growth and job creation".

Research also indicates that new business formation has been in decline across America and broadly across industry sectors for over forty years (Decker et al., 2015). Dearie (2021) continued, "If new businesses are the source of innovation, economic growth and job creation, and if new business formation is in decline, maybe that would explain why notwithstanding the herculean efforts of policymakers to accelerate economic growth and job creation, it wasn't working". According to Dearie (2021), policymakers and economic growth advocates should be more focused on the entrepreneurial economy if they want to see economic and job growth.

Entrepreneurship Education

Today, entrepreneurship education is widely acknowledged on campuses and in research publications across the globe. In 2014, there were 71 peer-reviewed journals dedicated to the subject, 1,600 colleges and universities offering at least one entrepreneurship course on the topic, and 4,000 endowed chairs (Neck et al., 2014). In addition, there are over 100 US-based entrepreneurship centers affiliated with academic institutions (Neck et al., 2014).

A degree in entrepreneurship signals to job recruiters an acquisition of in-demand 21st-century skills, such as collaboration, problem-solving, and communication (Drucker, 1985; Kauffman Foundation, 2005; Neck et al., 2014). Otani (2015) reported that Bloomberg publications surveyed recruiters to find out what competencies are most in-demand. The findings indicated a demand for analytical thinking, CPS, motivation, communication, global mindset, collaboration, and entrepreneurial mindset. Entrepreneurship education instills an action-oriented ability to address complex problems creatively, embrace ambiguity, identify opportunities, advocate for their ideas, tolerate risks, and adapt to change (McGrath & MacMillan, 2000). The process facilitates CPS, which supports paradigm shifts that can change society by shifting business models (Hunter, 2012). Additionally, most entrepreneurial education programs aim to (a) strengthen creative awareness, (b) recognize opportunities and take action, (c) act as an economic engine by training professionals and other educators, and (d) educate students about using business models to address economic and social problems (Hunter, 2012).

Best practices in entrepreneurship education have been thoroughly examined by the Organization for Economic Cooperation and Development (OECD) in a series of reports provided on the organization's website (OECD, 2021). An OECD Entrepreneurship360 report titled, Entrepreneurship in Education: What, Why, When, How provides a rich perspective regarding pedagogical approaches, value creation, competencies, tools, models, and processes (Lackéus, 2015). The OECD Entrepreneurship360 report focused on defining and assessing the entrepreneurial mindset (Krueger, 2015).

4. Entrepreneurship for Addressing Wicked Problems *(Cont.)*

Entrepreneurial Mindset

Entrepreneurship education typically aims to instill an entrepreneurial mindset using CPS for complex 21st-century issues (Küttim et al., 2014). Entrepreneurial mindset is defined as a cognitive process that empowers individuals to address problems and creatively generate ideas in uncertain environments (McGrath & MacMillan, 2000). The phenomenon is characterized by navigating uncertainty, pursuit of new opportunities, creative idea generation, problem-solving, growth mindset, risk-taking, iteration, and demonstrating tenacity (McGrath & MacMillan, 2000; Sardeshmukh & Smith-Nelson, 2011). Moore (2014) explained that entrepreneurial mindset education builds confidence in problem-solving and decision making. McGrath and MacMillan (2000) asserted that the entrepreneurial mindset consists of five characteristics, including (a) seeking new opportunities, (b) disciplined pursuit of opportunities, (c) filtering through and focusing on the best opportunities, (d) adaptively executing, and I inviting others to pursue entrepreneurial leadership. The entrepreneurial mindset is often assessed through competencies, which are outlined through the EntreComp framework. The framework includes 3 competence areas, 15 competences, and 442 learning outcomes (Bacigalupo, Kampylis, Punie, & Van den Brande, 2016).

Starters

The concept of starters emerged during the COVID-19 pandemic based on the premise that "We are all starters. All of us are born with an innate 'right to start,' to make an idea into reality" (Hwang, 2020, p. 5). In 2020, Victor Hwang, former Vice President of Entrepreneurship at the Ewing Marion Kauffman Foundation, launched the nonprofit, Right to Start, with the goal of influencing minds, policies, and community. According to Hwang (2020), "entrepreneurial opportunity ignites economic justice" and should be supported through (a) less red tape, (b) equal access to capital through financial innovation, (c) expanded access to entrepreneurial learning through local providers and libraries, and (d) a democratization of the ability to take risk through portable healthcare and student loan deferral. Hwang calls for policymakers to redirect 5% ($2.7B) of "workforce training and economic development funding to helping Americans start businesses through local entrepreneurial support organizations" (p. 35). With the appropriately trained entrepreneurship educators and evidence-based programming, community colleges are well-positioned to already take on the role. Hwang also recommended America's New Business Plan (www.startusupnow.org) for policy ideas to help drive prosperity through entrepreneurship (p. 36).

Changemakers

The changemaker is defined as an individual who is driven to creatively tackle an economic, social, or environmental problem. Changemakers take action, often through systemic interventions, to advance change for the purposes of simply improving society (Ashoka, 2016). According to Ashoka (2016), there are six types of changemakers, including:

- Social Architects- Policymakers and organizational leaders
- Influencers- Educators, researchers, journalists, and parents
- Investors- Impact investors and philanthropists
- Skills Catalysts- Accountants, lawyers, mediators, and computer programmers
- Inventors- Engineers and scientists
- Connectors- Conveners and community organizers

4. Entrepreneurship for Addressing Wicked Problems *(Cont.)*

Social Entrepreneurship

One type of changemaker is a social entrepreneur (Ashoka, 2016). According to Duke University's (n.d.) Fuqua School of Business and the Center for Advancement of Social Entrepreneurship,

Social entrepreneurship is the process of recognizing and resourcefully pursuing

opportunities to create social value with the innovative method. Social entrepreneurs are innovative, resourceful, and results-oriented individuals, who draw upon the best thinking in both the business and nonprofit worlds to develop strategies that maximize social impact. These entrepreneurial leaders operate in all kinds of organizations: large and small; new and old; religious and secular; non-profit, for-profit, and hybrid. (para. 1)

Dees (2001) described social entrepreneurs as change agents whose mission is to create and promote social value (rather or in addition to private value) through innovating, adapting, and continuous learning. While business entrepreneurs are viewed as focused on the economy, social entrepreneurs are focused on social change (Dees, 2003). According to Bornstein (2004), social entrepreneurs "are driven, creative individuals who question the status quo, exploit new opportunities, refuse to give up, and remake the world for the better" (p. 15). Dees (2003) emphasized the important role of innovation and impact of social entrepreneurship in which business-minded individuals and methods pursue innovative solutions to addressing social problems. In fact, some researchers have highlighted the important role that social entrepreneurs play as bridges between business and philanthropy by applying entrepreneurial theory to address societal problems related to the environment, equality, and economic issues (Roberts & Woods, 2005). After examining the literature surrounding social entrepreneurship, Jiao (2011) proposed that "higher levels of social entrepreneurship are positively related to social impact in society" (p. 139). Jiao (2011) encouraged governments, associations, and academic institutions to collaborate and cultivate a culture of problem-solving through social entrepreneurship.

According to Dees (2012), the field of social entrepreneurship is comprised of two cultures:" an old-age culture of charity and a more contemporary culture of entrepreneurial problem-solving" (p. 321). Dees (2012) asserted that success in social entrepreneurship requires a blend of both cultures, but Muhammad Yunus (1999), founder of Grameen Bank, acknowledged that often charity only perpetuates societal challenges, such as poverty. Frustrated by the charitable approaches to poverty, many thinkers sought a more systematic and scientific approach, which the researchers coined as "scientific charity". Social entrepreneurship is considered as an "extension of this analytic problem-solving thrust" (Dees, 2012, p. 322). Social entrepreneurs are motivated by their drive and ability to alleviate the damage caused by an unjust equilibrium (Martin & Osberg, 2007). Researchers have acknowledged that social entrepreneurs need to collectively work toward outcomes (Moriano et al., 2012), but too few social organizations track outcomes associated with their mission and strategies (Sawhill & Williamson, 2001).

The Schwab Foundation's Impact Study provides insight into the power of social entrepreneurs (Schwab Foundation for Social Entrepreneurship, 2020). According to the study, 130 entrepreneurs can collectively reach 662 million people across 190 countries for the purposes of supporting the Sustainable Development Goals. Additionally, the report outlines the most common issues social entrepreneurs work on, including education, economic opportunity and development, entrepreneurship and enterprise development, health and healthcare, environment and climate, gender equality, financial inclusion, workforce development, rural development, childhood and youth rights and development. In fact, the organization explicitly cites achieving measurable progress across all of the Sustainable Development Goals, which are described in the report as "a rally cry for action" (Schwab Foundation for Social Entrepreneurship, 2020, p. 10). A prominent group of philanthropic and multi-stakeholder organizations, including Ashoka, Catalyst2030, Schwab Foundation, Skoll Foundation, Echoing Green, and facilitation partner McKinsey & Company (2021) recently published a report titled, New Allies: How governments can unlock the potential of social entrepreneurs for the common good. In the report, social entrepreneurs are described as "the R&D engine for society – and government. They design, test, and debug new approaches that tackle the root causes of social problems. Once shown to work, their innovations inform better policies that increase prosperity, participation and equity for citizens" (p. 2). According to Bill Drayton, the founder of Ashoka, "Social entrepreneurs are not content with giving people fish or teaching people how to fish. They will not rest until they have revolutionized the fishing industry" (p. 7).

4. Entrepreneurship for Addressing Wicked Problems *(Cont.)*

The authors of the report also emphasized the need for 'systems social entrepreneurship'. According to Jeroo Billimoria, Chief Facilitator for Catalyst2030, "Systems social entrepreneurship is about a distinct way of approaching social problems, not about specific organizational forms or business models. To accelerate SDG achievement, we need to strengthen this entrepreneurial spirit and a culture of collaboration in all sectors" (p. 2). The Skoll Foundation's Chief Strategy Officer, Shivani Garg Patel, emphasized, "There are already many synergies between social entrepreneurs and government, notably a focus on systems-level solutions to address urgent societal challenges – and when they partner together, they can create impact at greater scale". Patel added, "By pairing the innovative solutions from social entrepreneurs closest to the issues with the reach and expertise of government partners, alliances are created that pave the way for truly transformational, sustainable change" (p. 2). The author's suggested that government players can "create the ecosystems that social entrepreneurs need to change policies, practices, power dynamics, social norms and mindsets" (p. 3). Therefore, entrepreneurial ecosystems play a critical role if community colleges are to address wicked problems collaboratively through partnerships.

Entrepreneurial Ecosystems

Entrepreneurial ecosystems are defined as, "the geographically-bound systems of individuals, organizations, physical resources, social structures, and cultural values that generate new venture activity" (Roundy, 2017, pp. 1221-1222). Evidence has indicated that these ecosystems are "potent engines for economic and community development" (Roundy, 2017, p. 1221). Various stakeholders, including accelerators, incubators, business plan competitions, and public funding incentives, promote synergies that can be harnessed to collectively address wicked problems (Volkmann et al., 2019).

Entrepreneurial Builders as Principal Investigators

Ecosystem builders are central players in entrepreneurial ecosystems, as they drive long-term and system-wide change by supporting innovation and entrepreneurship in their region or community (Gines & Sampson, 2019; Kauffman Foundation, 2021; Horn, A., 2017). These individuals contribute to local, regional, state-wide, and national goals by (a) leading recognized startup ecosystem building initiatives, (b) running entrepreneurial centers and coworking spaces, (c) managing accelerators, incubators, or startup school programs, (d) serving in professional economic development or government roles, or (e) investors and serial entrepreneurs investing in building their local ecosystem (Startup Champions, 2020; Kauffman Foundation, 2021; Horn, A., 2017).

Ecosystem builders occasionally serve as publicly funded principal investigators (PI) tasked with public sector entrepreneurship activities (Cunningham et al., 2019). The PI within this context is defined as "an influential entrepreneurial ecosystem actor, whose actions and behaviors shape and influence" economic and social change, often through activities involving research and complex multi-stakeholder engagement. Cunningham et al. (2016) identified ten roles and responsibilities of PIs when taking on public-sector activities

4. Entrepreneurship for Addressing Wicked Problems *(Cont.)*

Ecosystem Mapping

Ecosystem mapping, which leverages the actor and factor model, is a common starting point for communities seeking to build an entrepreneurial ecosystem or individuals new to a community (Feld & Hathaway, 2020). The process involves developing categories of who is involved in the ecosystem and what role that individual plays. Actors include the leaders, feeders, and instigators, while the factors include seven types of capital: human capital, intellectual capital, financial capital, institutional capital, cultural capital, network capital, and physical capital (p. 61). The broader entrepreneurial ecosystem involves accelerators, incubators, coworking spaces, entrepreneurial support organizations, large corporations, media, research and advocacy groups, local and regional government, national government, colleges and universities, service providers, investors, coaches, advisors, mentors, startup employees, and serial entrepreneurs (p. 187). However, ecosystems are not static, and therefore, the maps shouldn't be either. This realization has led many ecosystem builders to integrate network analysis models, which demonstrate dynamic relationships, mental models, and influence between players within the ecosystem (Feld & Hathaway, 2020). Strategic Doing is a multi-stakeholder process that leverages open innovation to build strategic value through collaborative dialogue, creating shared value for complex challenges (Morrison et al., 2019). The program has been used to prompt ecosystem action between multiple stakeholders within the entrepreneurial ecosystem (Morrison et al., 2019).

Ecosystem Logics

Ecosystems foster different institutional logics (Gulati et al., 2012), which are defined as "the formal and informal rules of action, interaction and interpretation that guide and constrain decision makers" (Ocasio & Thornton, 1999, p. 804). The two dominant logics within entrepreneurial ecosystems are entrepreneurial-market logic and community logic (Roundy, 2017). Entrepreneurial-market logic involves economic or capitalistic logic concerned with efficiency, competition, wealth accumulation, profit maximization, and value capture. Activities common within entrepreneurial-market logic often involve pursuing innovation, creativity, and opportunity, tolerating uncertainty, and developing new business models (Cunningham et al., 2002). Community logic emphasizes cooperation, altruism, community needs, and societal value creation (Marquis et al., 2011; Reay et al., 2015; Thornton et al., 2012).

The blended or hybrid logic is particularly important because of its influence on the effectiveness of problem-solving in the context of wicked problems of sustainability (Spigel, 2016). However, organizations juggling different logics commonly experience tension (Greenwood et al., 2011). For example, while entrepreneurial-market logic may emphasize maximizing profit, community logic often promotes altruistic goals (Smith et al., 2013). Several researchers have examined organizations that combine both market and community logics to address social problems through business methods (Smith et al., 2013).

Sustainability and Entrepreneurship

Sustainability and entrepreneurship have several common characteristics. For example, both require innovation through creatively combining resources in new ways (Nicholls-Nixon et al., 2000), are concerned with protecting future generations, and emphasize impact as a primary goal. Modern literature views sustainable entrepreneurship as an imperative for business success, whereas literature of the past sees the concept as capital cost without return (Bocken et al., 2014, p. 647). Similarly, Weidinger (2014) viewed sustainable entrepreneurship not as "a job for the do-gooders or idealists but rather an essential strategic decision" (p. 292).

4. Entrepreneurship for Addressing Wicked Problems *(Cont.)*

Sustainable Entrepreneurship

Entrepreneurship education develops creative problem-solving skills for social and economic issues, competencies aligned with sustainable entrepreneurship (Johansen, 2010; Lin & Nabergoj, 2014). Sustainable entrepreneurship (SE) is defined as discovering and creating entrepreneurial opportunities that improve social and environmental gains for members in society in an uncertain environment (Hockerts & Wüstenhagen, 2010; Pacheco et al., 2010; Shepherd & Patzelt, 2011), "consistent with sustainable development goals" (Pacheco et al., 2010, p. 471). The core concept is based on combining social entrepreneurship and environmental sustainability (Dean & McMullen, 2007). While social entrepreneurship is driven by mission over profit, sustainable entrepreneurship is driven by social and environmental problems without neglecting profit (Dean & McMullen, 2007). In the past, sustainable entrepreneurship was primarily focused on the environment but recently shifted to a societal focus, prompting more attention from the scientific community (Fellnhofer et al., 2014). Sustainable entrepreneurship is widely cited as a method for addressing environmental (Cohen & Winn, 2007; Dean & McMullen, 2007; York & Venkataraman, 2010) and societal issues (Zahra et al., 2009) faced in this century.

Ploum et al. (2018) used a qualitative method to examine several existing frameworks for sustainable entrepreneurship. Data were collected through a questionnaire distributed to a sample of 438 students at the University of Applied Sciences in the Netherlands. Findings suggested the seven key competencies for sustainable entrepreneurship include a) systems thinking competence, (b) embracing diversity and interdisciplinary competence, (c) foresighted thinking competence, (d) normative competence/stakeholder goal mapping, I action competence, (f) interpersonal competence, and (g) strategic management competence.

Sustainable Entrepreneurial Ecosystems

Cohen (2013) defined sustainable entrepreneurial ecosystems as "an interconnected group of actors in a local geographic community committed to sustainable development through the support and facilitation of new sustainable ventures" (p. 3). Volkmann (2019) explored how entrepreneurial ecosystems can promote addressing wicked problems of sustainability to support the SDGs. Welter et al. (2019) viewed sustainable entrepreneurial ecosystems within the larger holistic context of bettering society and the environment. According to Volkmann et al. (2019), four factors promote sustainable entrepreneurship: (a) possess a sustainability orientation, (b) recognize and mobilize for opportunities to address sustainability, (c) innovatively collaborate for sustainability initiatives, and (d) markets for sustainability are discovered or created. Bischoff and Volkmann (2018) identified factors needed for success in sustainable entrepreneurial ecosystems, including (a) a regional culture that supports entrepreneurs, (b) stakeholders specifically support sustainable business, and (c) collaborative networking supports sustainable entrepreneurship.

Corporate Social Responsibility

Corporate social responsibility (CSR) is often used interchangeably with social entrepreneurship but important differences between the two exist (Sarango-Lalangui et al., 2018). For example, CSR refers to expectations for the corporation to meet the needs of investors and stakeholders, while behaving ethically and without doing harm to society or the environment. While CSR accompanies the core business, sustainable entrepreneurship is embedded into the core business. In simple terms, CSR's goal is "doing less bad" while sustainable entrepreneurship aims to "do more good" (York & Venkataraman, 2010, p. 451).

4. Entrepreneurship for Addressing Wicked Problems *(Cont.)*

Triple Bottom Line

The concept of Triple Bottom Line (TBL) or 3P (People, Planet, and Profit) was introduced by Elkington and Upward (2016) as a practice method for balancing three dimensions of sustainability: economic health (profit), societal equity and justice (people), and environmental resilience (planet) Hockerts & Wüstenhagen, 2010). Haines (1998, p. 10) suggested the dimensions are in hierarchal order. The which would explain why the terms sustainability and environment are sometimes used interchangeably (Pacheco et al., 2010). Today, the TBL concept is a widely accepted framework appropriate for explaining how sustainable entrepreneurs operate (Elkington, 1997).

5. Value Creation for Society, Academic Institutions, and Students

Researchers have considered MSIs to be an innovative model for bringing together actors who each contribute resources for the purpose of addressing challenges for collective impact. Assessing the effectiveness of MSIs in relation to wicked problems remains an open question (Austin & Seitanidi, 2012). The high level of complexity of wicked problems makes pinpointing the cause-and-effect relationship generated by MSIs for value creation a changing and often impossible task (Hospes, 2008). Management scholars agree that MSIs typically lead to value creation (Margolis & Walsh, 2003; Porter & Kramer, 2011), often yielding more impact than efforts of single individuals (Teegen et al., 2004; Warner & Sullivan, 2004).

According to Lackéus (2015), the value created is dependent on the stakeholder. For example, business entrepreneurs typically seek to create value for customers, employees, and shareholders. Alternatively, social entrepreneurs create value for society. Entrepreneurship educators often aim to create value through job creation, economic success, innovation, and economic renewal. Other less common but promising value creation outcomes of entrepreneurship education include joy, engagement, creativity, and tackling societal challenges.

According to Jameson and O'Donnell (2015), the entrepreneurial higher education organization seeks to create economic, societal, cultural, and technological value. Lackéus (2015) proposes three level of analysis for value creation, including individual, organizational, and societal. Lackéus (2015) proposes three levels of value creation, including individual, organizational and societal. In this section, the researcher will explore these three levels of value creation. Additionally, a brief overview of commonly employed entrepreneurial value creation tools is provided

› Value for Society

Dentoni et al. (2016) affirmed that stakeholder-oriented organizations are ideally suited to tackle wicked problems, which are large, messy, and complex (Rittel & Webber, 1973). The orientation is considered crucial for creating societal impact through cross-sector partnerships (Dentoni et al., 2016). After all, the various partners are able to access additional resources and capabilities they would not have been able to otherwise (Austin, 2000; Rondinelli & London, 2003; Waddell, 2000). Specifically, problem sharing helps to co-design and implement new solutions aimed at addressing the wicked problems (Murphy et al., 2012), which are quite relevant to established sustainability goals (Austin, 2000; Rondinelli & London, 2003).

Trujillo (2018) explored systemic change through partnerships between private, public, and social sectors for the purposes of addressing wicked societal problems. The qualitative embedded case study sought to answer the question: How do cross-sector collaborations lead to systemic change? The study highlighted examples of economic, social, and political change with an emphasis on the model of alliance and beneficiaries' increased capacity for collective action, value creation, and systemic change.

Academic institutions are uniquely positioned to provide valuable support in the form of technical expertise, cultural mission, and legitimacy as regional leaders (Arbo & Bennworth, 2007). Devine-Wright et al. (2001) outlined several benefits, including the contribution of:

1. systems-thinking and critical thinking perspectives crucial for addressing social, environmental, and environmental issues
2. new products and services
3. fundraising support
4. increased acceptability with the broader public regarding recommendations and results (Zilahy & Huisingh, 2009)
5. setting the standard through visible action toward sustainable development
6. network facilitation and convening of regional networks around a common cause
7. strengthening of social capital and bridging of bonds between partners

In an effort to support environmental sustainability, the AACC launched the Center for

Sustainability Education and Economic Development (SEED), which today boasts 479 member institutions (https://theseedcenter.org/). According to the center, "Community colleges are ideally positioned to help ensure that low-income under and unemployed workers can advance into family-sustaining careers, while the communities in which they live improve resilience to climate insecurity" (White & Cohen, 2014, p. 7). In 2014, the center published A Guide to Climate Resiliency & the Community College, which encourages community colleges to participate in local decision making and contribute through the mobilization of faculty, staff, and workers. The guide provides resources, case studies, research, and practical recommendations for participating in planning, developing curriculum, and integrating workforce development into the cause (White & Cohen, 2014).

› Value for Academic Institutions

Multi-sector initiatives contribute value to organizations in the form of new strengths, advantages, and assets, such as technical and management skills, human capital, and the ability to improve the organization's reputation (Barney, 1991; Penrose, 1959; Wernerfelt, 1984). Dentoni et al. (2016, p. 37) explained that "scarce resources, such as tacit and competence-related knowledge are often available through the partnerships" (Dierickx & Cool, 1989; Barney, 1991; Gulati, 1999; Peteraf, 1993; Prahalad & Ramaswamy, 2004).

Organizational incentives for multi-stakeholder collaboration most cited throughout the literature include access to financial capital, market knowledge, management experience, provisional knowledge, legitimacy, and community relationships, such as non-governmental (Dahan et al., 2010; Waddell, 2002). These capabilities are rarely stronger in one organization than would be through partnerships (Robinson & Berkes, 2011). In addition, organizations often benefit financially through new sources of funding or cost savings through shared services. Non-financial gains may include in-kind contributions of goods, services, and volunteers. Non-tangible benefits include "social or political capital; networking and connections; increased legitimacy; reputational benefits; influence and positioning; knowledge and capacity building; innovation in thinking and employee morale and retention" (Stibbe et al., 2019, p. 14)

Zilahy and Huisingh (2009) qualitatively surveyed individuals in regional sustainability initiatives and reported the following benefits to the institution of higher education: (a) educational/research benefits, such as faculty and student involvement in problem-solving for sustainability; (b) institutional benefits, such as increased credibility, improved public image, and increased access to new sources of funding; (c) benefits for the region, such as faculty and stakeholder engagement for systems-thinking, social, environmental and economic factors, the facilitation of critical thinking by faculty; and (d) the development of products and services that are knowledge-based, and through helping to obtain funding for societal stakeholders.

MSIs also provide opportunities for mutual learning and the production of knowledge (Albrecht et al., 2007; Lehmann et al., 2009; Manring, 2014), new funding sources (Zilahy & Huisingh, 2009), an increased level of public transparency and accountability (Albrecht et al., 2007), and an increase in student engagement with societal problems (Zilahy & Huisingh, 2009). Ferrer-Balas et al. (2010) contended that partnerships enable institutions of higher education a way of "going beyond the rhetoric" (p. 607) and implementing system-wide changes aimed at more sustainable societies. Weidinger (2014) asserted, "Without sustainable organizations, there is no sustainable development, thus, no future" (p. 289).

› Value for Students.

Research has indicated that individuals participating in MSIs employing collaborative rationality benefit students through developing new relationships, engaging in opportunities for reciprocity, and learning about the problems and other participants (Innes & Booher, 2016).

› Entrepreneurial Value Creation Processes, Tools, Methods, and Theories.

Value creation is often supported through entrepreneurial processes, tools, methods, and theories, including Effectuation (Read et al., 2011), Customer Development (Blank, 2005), Business Model Generation (Osterwalder & Pigneur, 2010), Lean Startup (Ries, 2010), Appreciative Inquiry (Bushe & Kassam, 2005), Service-Learning (Steinke and Fitch, 2007, p. 24), Design Thinking (Johansson-Skoldberg et al., 2013), Systems Thinking (Patel & Mehta, 2017), and Entrepreneurial Thinking (Patel & Mehta, 2017). Notably, the tools are used by entrepreneurs, intrapreneurs, and changemakers. In this section, the tools will be briefly explored.

Effectuation

Effectuation theory is a thinking framework and set of heuristics, which emphasizes taking action based on available resources for goal achievement (Sarasvathy, 2001). Rather than starting with a pre-determined goal and well-designed linear process to achieve the goal, as is common in causal logic, effectuation relies on effectual logic. Sarasvathy (2001) explains that effectual logic is more appropriate for the uncertain environment entrepreneurs navigate. The four principles of effectuation are a) bird-in-hand, which encourages value creation based on the resources one currently has access to, b) lemonade principle, which emphasizes that mistakes are inevitable but can lead to new opportunities, c) crazy quilt, which views new partnerships as opportunities to gain new perspectives and funding because meeting new people often expands who and what you know, d) affordable loss, which encourages the individual to only invest the amount they are willing to lose (Sarasvathy, 2001). In general, the individual is encouraged to "begin with a simple problem for which you see an implementable solution – or even something that you simply believe would be fun to attempt (Read et al., 2011, p. 19). While using effectuation, "action trumps analysis" (p. 50).

Business Model Canvas

The Business Model Canvas is a one-page visual tool used to describe how an organization or individual "creates, delivers and captures value" (Osterwalder and Pigneur, 2010, p.14). The nine building blocks of the canvas include the key partners, key activities, key resources, cost structure, value proposition, customer relationships, channels of distribution, customer segments, and revenue streams. Once the student maps out the idea (or hypothesis), the user is encouraged to interact with potential customers to inquire about the potential customer or end user's pain points. Several variations of the model exist, including a mission model canvas, which is often used by social entrepreneurs and changemakers. Several other visual tools are available to support business model innovation. Taeuscher & Abdelkafi (2016) analyzed 45 different visual tools for business model innovation in which the Business Model Canvas is only one.

Customer Development

Customer Development is a value creation tool that encourages the student to consider, “What is the smallest or least complicated problem that the customer will pay us to solve?” (Blank and Dorf, 2012, p. 80). Blank and Dorf (2012) emphasized, “there are no facts inside your building, so get outside.... And into conversations with your customers” (p. 24). While employing customer development, the action involves conducting experiments to test the original hypothesis, which often evolves, based on patterns of new information gained through customer feedback loops.

Appreciative Inquiry

Appreciative inquiry is a theoretical framework that involves focusing less on problems that need to be solved and more on “examples of the system at its best” (Busche & Kassam, 2005, p. 165). Researchers often take a research-based approach to determine best practices. The method also involves creating new “knowledge, models, and images that are compelling to system members and provoke people to take action” (p. 165). According to the literature, intervention happens through a combination of inquiry and infusing inspiration, joy, and motivation, which together prompts change (Beer et al., 1990). The infusion of positive energy and motivation is critical for overcoming the natural instinct of many to resist change (Beer et al., 1990).

Service-Learning

Service-learning is defined as “an organized educational experience that both meets needs of the community and fulfills learning objectives” (Steinke and Fitch, 2007, p. 24). The experience, which falls between an internship, practica, and volunteering, involves “creating tangible and intangible benefits for involved participants” (Kenworthy-U’Ren et al., 2006, p. 122). Through the process, “students engage in real-world, concrete, professional, semester-long consulting experiences” (p. 128) involving “faculty, students and community working together” (p. 122).

According to the American Association of Community Colleges (AACC), “nearly 60 percent of all [American Community] Colleges offer service-learning in their curriculum” while “another 30 percent are interested in starting service-learning initiatives” (Traver & Katz, 2014, p. 2). In 2012, the national Civic Learning and Democratic Engagement National Task Force called for “civic reform movement”, arguing that “the more civic-oriented that colleges and universities become, the greater their overall capacity to spur local and global economic vitality, social and political well-being, and collective action to address public problems” (Civic Learning and Democratic Engagement National Task Force, 2012, p. 2). The US Department of Education agreed, stating, “To fulfill America’s promise in our global society, our education system at all levels, from early learning through higher education, must serve our nation both as its economic engine and its wellspring for democracy” (Kanter and Ochoa, 2012). Traver & Katz (2014) provided a deeper perspective regarding the community college mission alignment with service-learning, as well as contextual considerations, student success outcomes, pedagogical, best practices, as well as other theoretical and empirical perspectives.

Design Thinking

Design thinking is defined as “a process of actions and decisions aimed at producing products, services, environments, and systems that address a problem and improve people’s lives” (Boni et al., 2009, p. 409). The central tenets of design thinking are multi-disciplinary, human-centered, prototype-driven, and ideation-based. According to Katz & Brown (2009), design concepts are employed as agents of change. The empathy-driven process involves working directly with end-users to understand their pain points and stressors for the purposes of designing a human-centered solution or intervention to address the pain points described. During the process, students ask questions such as, “How might we support students during COVID-19?”. The rigorous methodology also acts as a “mechanism for nurturing future leaders’ and “brings creative techniques to the public for the greater good” (Patel and Mehta, 2017).

Systems Thinking

Systems thinking is defined as “a process of understanding interactions and influences between various components in a system to solve complex problems, by addressing every issue as a component of a larger system, rather than an independent aspect with non-related consequences” (Patel & Mehta, 2017, p. 517). The concept is characterized by several key concepts, including a) viewing and addressing problems holistically, b) a mindset of consistent learning, adaption, and resilience, rather than planning, execution, and rigidity, c) a reliance on the synthesis of information and intuition, d) the willingness to take accountability for conditions and act to improve them, e) an understanding that “meaningful, lasting change requires addressing deep, structural problems over a sustained period”, f) a small number of high leverage interventions have a more significant impact than single, isolated interventions (Feld & Hathaway, 2020, p. 215). According to Patel and Mehta (2017), the central tenets of systems thinking are interdependence, differentiation, regulation, abstraction, and multi-finality.

MIT professor and systems scientist, Peter Senge, published The Fifth Discipline: The Art and Practice of the Learning Organization in 1990. In the book, Senge explained that humans tend to focus on what is happening around them simply because it is most observable, failing to recognize the underlying mental models which influence what is happening on the surface. To illustrate the point, Senge introduced the Iceberg Model of Systems Thinking (Meadows, 2008; Stroh, 2015). The model encourages one to think critically about the reasons for the event or activity. What has changed? For example, if job creation numbers are declining within a region, what has happened that may have caused the decrease? Perhaps the local community college discontinued community classes aimed at business startups. Next, the model encourages an inquiry into why this happened. Maybe state budget cuts have forced college administrators to make cuts based on which courses are not financially sustainable. The model now prompts questions about underlying assumptions and beliefs which drive the behavior. Perhaps the college assumed additional funding was not available to support entrepreneurial job creation. The root cause can now more effectively be addressed.

Systems thinkers also naturally consider how seemingly unrelated issues are interconnected (Mansharamani, 2020). As Harvard Business professor Mansharamani (2020) has explained, “Breadth of perspective and the ability to connect the proverbial dots (the domain of generalists) is likely to be as important as the depth of experience and the ability to generate dots (the domain of specialists)” (p. 1). Similarly, one of Google’s top recruiters emphasized that the organization values problem-solvers who possess “general cognitive ability” over knowledge related to a specific role (Mansharamani, 2020, p. 3). Entrepreneurial systems thinking is critical for addressing wicked problems (Feld & Hathaway, 2020).

Entrepreneurial Thinking

Entrepreneurial thinking is defined as “a mindset that emphasizes recognizing opportunity and learning to capitalize on it in a manner unique to the situation” (Patel & Mehta, 2017, p.518). The mindset involves applying effectual reasoning, or discovery-driven planning, that influences the goals to shift as new information is gained, rather than starting with concrete goals. According to Patel and Mehta (2017), entrepreneurial thinking’s central tenets are collaboration, value creation, discovery-driven, and resilience. Modern research has increasingly focused on the higher-order cognitive strategies leveraged by entrepreneurs (Haynie et al. 2010).

Interestingly, after Patel and Mehta (2017) examined the individual tenants of systems, design, and entrepreneurial thinking, the intersections between the three were analyzed. According to the analysis, entrepreneurial thinking is a mindset used to identify opportunities to create value and resilience through collaboration and human interaction. Once the idea has been identified, design thinking harnesses human-centered design to explore and refine the problem statement with a multi-disciplinary and multi-stakeholder lens, ideate for potential solutions or interventions ideally with the end-user while building and testing prototypes of the solution. Finally, systems thinking views the proposed solution through a lens of holistic interdependence, which means that “the parts only have meaning in relation to the entire system” (Patel & Mehta, 2017, p. 521). Informed system thinkers often hesitate to implement interventions before thoroughly understanding the whole system to avoid unintended consequences of a proposed intervention.

According to Patel and Mehta (2017), “when an entrepreneurial thinker attempts to create value through innovation, he or she leverages design thinking to identify new opportunities”. Additionally, “design thinking facilitates the creation of intrinsic value in products or ideas, whereas entrepreneurial thinking is a means of bringing that value to realization” (p. 525). Finally, systems thinking “harmonizes improvement across an entire ecosystem” (Patel & Mehta, 2017, p. 525). The processes, tools, methods, and theories are often used together as a toolbox for complex problem-solving. Often, the question is, which tool or combination of tools is best suited to address the problem at hand?

Recommendations for Policy and Practice

Program and community college leaders of multi-stakeholder initiatives provided insight as to (1) the role of community colleges in entrepreneurship, economic development, and addressing wicked problems of sustainability and (2) how the mission of community colleges is aligned with addressing wicked problems of sustainability. The cross-case analysis is based on three data sources: semi-structured interviews with MSI program founders and/or leaders, research articles, and program websites. The researcher recommends policymakers, funders, and community college leaders allocate pilot funding for the creation of a community college plan for SDG localization, as well as a community college systemic innovation lab (I-Lab) to further develop and execute the plan. The overarching goal of the I-Lab is to address wicked problems aligned with the community college mission through scalable, localized, and data-driven visualization strategies.

Strategies should take into consideration the changing geopolitical landscape. On January 20, 2021, President Joseph Biden was confirmed, dramatically changing the policy and funding landscape for the next 4-8 years. The priorities of the Biden administration became clear through the slew of executive orders during the first few days in office. The orders were notably aligned with the Sustainable Development Goals (SDGs), including climate change, racial and gender inequality, infrastructure, innovation, clean energy, democracy, poverty, hunger, economic growth, and job creation.

In recent years, rural community colleges have experienced tightening budgets due to decreased state investment and decreased student enrollment (Rush-Marlow, 2021). The COVID-19 pandemic further devastated the institutions. According to the Association of Community College Trustees (ACCT), the COVID19 pandemic "deepened the prosperity gap between rural and non-rural communities", leaving "rural community colleges struggling to dig their students out of an ever-deepening ditch" (Rush-Marlow, 2021, p. 1). Between the scarce resources, high rates of poverty, lack of mental health resources (Campbell, Richie, & Hargrove, 2003; Wagenfield, 2003), high rates of suicide (Roberts, Battaglia, & Epstein, 1999), alcohol abuse, opioid addiction (Centers for Disease Control and Prevention, 2011), chronic illness (Wagenfield, 2003), and the stigmatization surrounding mental health issues (Larson & Corrigan, 2010; Stamm et al., 2003), an evolved approach to social justice advocacy is needed (Bradley, Werth, & Hastings, 2012).

Due to these multiple crises, rural community colleges may stand to benefit the most from issue-focused efforts toward addressing wicked problems. Each year, significant investment is committed to SDG-related funding. In 2016 alone, $84 billion was invested in SDG#4, education for sustainability (see Appendix S). As a reminder, sixteen other SDG issues exist, each tied to philanthropic funding, which can support the wicked problem being tackled.

With the appropriate funding and incentives, community colleges could be well-positioned to help the new Biden administration scalably and sustainably achieve outlined policy goals, while also supporting the college's mission. By supporting systems of education, the positive societal impact efforts will not be limited to the political cycles and, therefore, will live on beyond the administration's timeline.

Entrepreneurial SDG programming, in an open-access format, with an integration of service-learning, can support the process of rebuilding a better and more equitable post-COVID America. As an added bonus, educating students about the SDGs informs them about the broader issues in society, instilling a culture of empathy for others. Finally, integrating the global goals in community colleges across the nation would send a message to our global partners that the new administration supports global issues. This section will serve to outline related recommendations for policy and practice.

Recommendation #1

› Create a Community College SDG Localization Plan for CC Leaders

America's community colleges have an opportunity to be engines of recovery post-COVID. In order to streamline and scale this vision, community college leaders will need a clear plan of action well-aligned with their roles and institutional missions. As a reminder, a review of 200 community college mission statements revealed a strong preference for supporting the local community, rather than society globally (Williams & Nourie-Manuele, 2018). Similarly, researchers believe community colleges best serve the public's interest by tackling problems within their local community (Hanson, 2008). However, community colleges, as an honest broker, can localize the Sustainable Development Goals framework through entrepreneurial programs and focus on issues unique to each local community.

The Sustainable Development Goals (SDGs) provide a framework for generating awareness and taking action to address global challenges at a local level for positive societal change. In order to accomplish this goal, college administrators and policymakers will need a clear plan of action to holistically and scalably incorporate the SDGs across academia.

By supporting efforts to localize the Sustainable Development Goals, broader global goals are also supported. Research indicates that addressing wicked problems, such as hunger climate change, and economic growth requires coordinated action and partnership between multiple stakeholders (Williams & Nourie-Manuele, 2018). Therefore, the localized plan would need to follow processes, frameworks and other models suitable for multi-stakeholder initiatives collectively tackling wicked problems.

The current study indicates that community colleges play five key roles, including educator, local convener, strategic leader, and economic development partner when addressing wicked problems of sustainability. The entrepreneurial ecosystems, programming, and leadership strategies are also key to localizing positive societal impact. Collectively, these are critical components for rebuilding better and more equitable post-COVID communities.

To support this vision, the researcher recommends the creation of an action plan for localizing the SDGs in community colleges across America to re-build better. The recommended plan would align with the findings of the study, as well as existing local, national, and global SDG reports from partners, such as Catalyst2030 and UNA-USA (see Appendix P), as well as recent entrepreneurship policy initiatives, such as America's New Business Plan (www.startusupnow.org). Additionally, the action plan could serve as a response to the JLARC (2017) recommendation to develop a strategic plan for identifying student barriers and recommending short-term and long-term actionable strategies targeted toward improving underserved student outcomes (recommendation 6).

Topics in the plan may include an overview of the role of community colleges in addressing wicked problems of sustainability, mission alignment, as well as programs and activities customized for five key stakeholder audiences:

1. **An educator's strategy** – The educator's strategy will include recommendations for open-access curriculum, outcomes, rubrics, interdisciplinary service projects, competitions, opportunities for civic engagement and participation in democracy without emphasizing any partisan outcome. The strategy will also emphasize entrepreneurial approaches to local action for global goals in a post-COVID environment.

2. **A strategic leadership strategy** – The strategic leadership strategy will include recommendations of free or affordable professional development for faculty, tools for collaborative problem-solving, solution competitions for post-COVID issues, incentivization for faculty and staff, communication strategies, systems alignment, potential allies, networks and aligned fundraising for scalability.

3. **A convening strategy** – The convening strategy will include multi-stakeholder facilitation strategies and certification, entrepreneurial ecosystem engagement, partnering for social and economic mobility, and online collaboration tools available.

4. **An economic development strategy** – The economic development strategy should encompass topics, such as job creation, business triage support post-COVID, entrepreneurial-led economic development, increasing tax revenue, revitalizing communities, talent pipelines, attraction and retention, 21st century skills and ideas for modeling sustainability.

5. **A grants strategy** – A grants strategy will include opportunities for funding related to educational programs, leadership action, local convening and facilitation assistance, and economic development support.

Recommendation #2

› Launch a Community College Innovation Lab (I-Lab) to Execute the Localization Plan

America experienced a plethora of interconnected challenges in 2020, including a global pandemic, inequality, poverty, hunger, racism, climate change and economic growth, just to name a few. However, with the election of President Joseph R. Biden, community college leaders have an opportunity to maximize pandemic recovery efforts to rebuild a more equitable America. To support this goal, a cross-reference of President Biden's priorities, Sustainable Development Goal issues, and the impact on community colleges is provided in Appendix O. Community colleges, through entrepreneurial programming, have the potential to accomplish the administration's priorities while also aligning with the mission of community colleges, essentially becoming engines of scalable post-COVID recovery. Ultimately, the I-Lab would serve to act as a solution ecosystem to address wicked problems impacting student success, open access, local communities and economic development. Addressing these challenges will require adequate funding.

However, funders will need to determine how to allocate post-COVID relief money and donations for maximum societal return on investment**. The researcher recommends that pilot funding be allocated to a state community college system for building a scalable community college Innovation Lab (I-Lab) model, which after validated can expand the open-access model throughout the nation in partnership with a national community college association. A publicly funded principal-investigator framework may prove to be an ideal model for leading the initiative.** According to Cunningham et al. (2019), principal investigators (PI) are defined as "influential ecosystem agents, whose behaviors shape and influence" economic and social change through complex multi-stakeholder engagement and research projects. Cunningham et al. (2016) studied the allocation of time for publicly funded principal investigators tasked with supporting public sector entrepreneurship activities. In the study, the researcher identified ten roles and responsibilities PIs take on in academia with a focus on problem-based activities and value creation (p. 546).

By allocating funding to support community colleges acting intentionally and entrepreneurially in this capacity at a state and/or nationwide level, the funding will holistically address post-COVID challenges through open access, streamlined, and scalable pathways through localization. Additionally, the funding would ensure entrepreneurship educators are trained on the ideal evidence-based programming for their local needs. Finally, the funding could prioritize both rural and urban underserved institutions, which were already stretched thin before the pandemic. Without the appropriate funding incentives, the goals are less likely to achieve wide adoption.

PERIODIC TABLE OF PROGRAM ACTIVITIES

THE ROLES OF COMMUNITY COLLEGES

IN ADDRESSING WICKED PROBLEMS OF SUSTAINABILITY (SDGS)

HOW DO LEADERS OF MULTI-STAKEHOLDER INITIATIVES DESCRIBE THE ROLE OF COMMUNITY COLLEGES IN ENTREPRENEURSHIP, ECONOMIC DEVELOPMENT, AND ADDRESSING WICKED PROBLEMS OF SUSTAINABILITY?

THE ROLES OF COMMUNITY COLLEGE INCLUDE:
**BASED ON ENTREPRENEURIAL PROGRAMS*

- EDUCATOR *(EDUCATIONAL VALUE)*
- STRATEGIC LEADER *(STRATEGIC VALUE)*
- LOCAL CONVENER *(COMMUNITY VALUE)*
- ECONOMIC DEVELOPMENT PARTNER *(ECONOMIC VALUE)*
- GRANT PARTNER *(APPLIED ACROSS ALL ACTIVITIES)*

1 ET Educating & Training						24 CCs Convening Conversations	29 ELC Emphasizing Learning & Certification	34 CC Acting as a Catalyst for Change	39 SED Supporting Entrepreneurship-Led Development
2 LE Incorporating Lived Experience	7 SE Teaching Sustainable Entrepreneurship								
3 EM Teaching Entrepreneurial Mindset	8 ST Teaching Systems Thinking					25 FC Facilitating Conversations	30 EC Engaging the Community	35 RC Revitalizing Communities post-COVID	40 TR Increasing Tax Revenue
4 IP Planning Interdisciplinary Projects	9 DT Teaching Design Thinking	12 EP Executing Programs & Managing Projects	15 FA Fiscal Agent & Partner	18 TL Thought Leader	21 SL Structural Leader & Community Pillar	26 BC Building Consensus Collaboratively	31 OS Offering Safe Spaces	36 BT Post-COVID Business Triaging	41 PT Pipelining Talent
5 CS Teaching Complexity Science	10 UC Informing about Unintended Consequences	13 ISA Igniting a Sense of Agency	16 LI Local Informer	19 PH Post-COVID Healer	22 AE Architect/ Engineer	27 CP Community Problem-Solving	32 SB Spanning Boundaries	37 MS Modeling Sustainability	43 MSB Supporting Main Street Businesses
6 CC Teaching SDG Cross-Campus Curriculum	11 RM Recruiting Mentors & Participants	14 DCI Dialogue & Communication Influencers	17 SDE Supporter of Diversity & Equity	20 MG Mobility Generator	23 PS Promoter of Positive Stories	28 EI Engaging Inclusively with Integrity	33 HE Hosting Events & Programs	38 CJ Creating Jobs	44 RE Reducing Entrepreneurial Risk

SUSTAINABLE DEVELOPMENT GOALS

GLOBAL GOAL ALIGNMENT:

EDUCATIONAL VALUE | STRATEGIC VALUE | COMMUNITY VALUE | ECONOMIC VALUE | *ENVIRONMENTAL PILLAR*

PERIODIC TABLE OF ENTREPRENEURIAL VALUE CREATION

COMMUNITY COLLEGES MISSION ALIGNMENT

IN ADDRESSING WICKED PROBLEMS OF SUSTAINABILITY (SDGS)

HOW DO COMMUNITY COLLEGE LEADERS IN MULTI-STAKEHOLDER INITIATIVES DESCRIBE HOW THE MISSION OF COMMUNITY COLLEGES IS ALIGNED WITH ADDRESSING WICKED PROBLEMS OF SUSTAINABILITY?

THE COMMUNITY COLLEGE MISSION ALIGNMENT (BASED ON PROGRAM VALUE):

- STUDENT SUCCESS *(EDUCATIONAL VALUE)*
- ACCESS *(STRATEGIC VALUE)*
- LOCAL COMMUNITIES *(COMMUNITY VALUE)*
- ECONOMIC DEVELOPMENT *(ECONOMIC VALUE)*

1 **CPS** Creative & Complex Problem-Solving	7 **TB** Therapeutic Team-Building Opportunities																35 **IEC** Infusing an Entrepreneurial Culture		41 **ES** Adding to Local Economic Success
2 **DT** Design Thinking Knowledge	8 **SD** Self-Directed Learning Experiences											25 **PIA** Access to Paid Internships & Apprenticeships	30 **CPT** Community Cross-Pollination of Thought				36 **SEE** Sustainable Entrepreneurship Ecosystems		42 **TR** Increasing Tax Revenue
3 **CD** Convergent & Divergent Thinking	9 **JO** Job Opportunities & Placement											26 **S** Access to Scholarships	31 **DI** Supporting Local Diversity & Inclusion				37 **CS** Employer-Demanded 21st Century Skills		43 **EET** Entrepreneurial Education in the Trades
4 **ER** Economic Resilience Tools	10 **FB** Promoting a Felling of Belonging	13 **SEM** Access to Social & Economic Mobility	16 **BN** Access to Basic Needs	19 **SM** Access to Subject Matter Connections	22 **CEC** Access to Cutting-Edge Curriculum					27 **SDI** Supporting Democratic Ideals	32 **DTW** Design-Thinking Workshops						38 **OI** Organizational Innovation		44 **SBS** Post-COVID Small Business Support
5 **SE** Building Self-Efficacy Skills	11 **CC** Opportunities for College Credit	14 **LL** Access to Lifelong Learning	17 **RK** Access to Research Grant Knowledge	20 **EI** Programming for Equity & Inclusivity	23 **EE** Access to Empathetic Environments					28 **IC** Local Issue Convening & Collaboration	33 **CE** Community Civic Engagement Education						39 **IR** Increasing Small Business Revenue		45 **ERS** Employee Recruiting & Screening
6 **IL** Cultivation of an Internal Locus of Control	12 **RRC** Recruitment, Retention, & Completion	15 **E** Access to Empowering Programming	18 **MC** Access to Mentor Connections	21 **IE** Access to Interdisciplinary Experiences	24 **AL** Access to Applied & Service Learning					29 **CP** Community Problem-Solving	34 **LW** Programming for Local Livable Wages						40 **JC** Entrepreneurial Job Creation		46 **EER** Employer Engagement & Retention

SUSTAINABLE DEVELOPMENT GOALS

GLOBAL GOAL ALIGNMENT:

Key Participant Quotes

Role of Community Colleges

› Role of Educator.
"[The student] apprentices with the problem [using a] diversity, equity and inclusion lens [so they have] self-awareness [and are] really thinking about the full impact [and unintended consequences] of what they are doing." [Unintended Consequences]

› Role of Strategic Leader.
"We have the opportunity, as community colleges to heal a lot of social issues. Because if you look at the people that we serve, they're the people that have been really damaged further by the pandemic. They were left behind before. But now they're even further behind. You know... people of color, immigrants, veterans, and people with disabilities."

› Role of Local Convener.
"With over 1100 community colleges sitting virtually within a short drive of every single, urban, rural, and suburban community in the country and with their open access mission, they have a huge opportunity to be catalysts and conveners of conversation and [take] action toward addressing wicked problems." [Convening Conversations & Acting as a Catalyst of Change]

› Role of Economic Development Partner.
"If you look at the trends and headlines about jobs.... they talk about how we're going to create 250 new jobs for your community over time. With the exception of a few like Amazon they're [actually] shedding jobs. They're not creating new jobs. It's your startups and small businesses that are creating the net new jobs... In one city we've worked with, over the last five or six years, young and new firms are creating between 14,0000 and 15,000 net new jobs every year." [Creating Jobs]

› Role of Grant Partner.
The community college is in receipt of grant funding that is intended to support students who struggle with being unhoused. We partner with them to pull our resources because those resources are restricted to pretty specific things like housing, right? [We are] in the business of housing. We help with things like emergency food, emergency utilities, clothing, allowances, technology support, so that they have the capacity to learn in school and have the same technology other students have. A really practical partnership is figuring out what [the community college] is restricted from doing and figuring out how we can fill in those gaps, pool our resources, and stretch our dollars.

Mission Alignment

› Mission Alignment with Student Success.
Ms. Foster described how the program contributed to retention: "The interpersonal connection [provided during the maker space program] was powerful for retention because students need to develop a meaningful relationship. This is the #1 reason students drop out. They don't feel connected to anyone or anything". [Recruitment, Retention & Completion]

› Mission Alignment with Equal Access.
"Community colleges are the most radically democratic system of education in the world. Our bar for entry is the ability to benefit, which either sounds revolutionary and democratic to people, or it sounds like a slight, and to me it's revolutionary and democratic. And so, we see the most diverse population of students.... They may be a lifelong learner, improve job skills, wanting to transfer, or just wanting to take a class. That makes us an environment where lots of different ideas [collide] and different kinds of people [have access]." [Access to Social & Economic Mobility]

› Mission Alignment with Supporting Local Communities.
"More so than any other group in higher education our job is to solve the problems of people in communities. I and hundreds of [community college leaders] across the country put their feet on the floor in the morning thinking, 'how do I solve problems for people?' We must be more than a convener. Higher education oftentimes lets themselves off the hook in terms of doing, because they've taken on that role of convener. Well, I got news for you just putting people in the room, won't get it done. We are the people and communities, problem solvers." [Community Problem Solving]

› Mission Alignment with Economic Development Partnership.
"A recent [survey by a state university indicated], for every $1 put into the program, our clients generated $97 in revenue." Another participant stated, "We've supported over 15,000 businesses through our programming where the launch and survival rate after two years [averages] 83%. Not just launched, but actually launched and survived". [Increasing Tax Revenue & Adding to Local Economic Success]

Key Definitions

› Appreciative Inquiry.
Appreciative inquiry is a theoretical framework that involves focusing less on problems that need to be solved and more on "examples of the system at its best", often through a research-based approach" (Busche & Kassam, 2005, p. 165).

› Backbone Organization.
A key collective impact partner responsible for "guiding vision and strategy, supporting aligned activities, establishing shared measurement practices, building public will, advancing policy, and mobilizing funding" (Turner et al., 2012, Para. 2).

› Business Model Canvas.
The Business Model Canvas is a one-page visual tool used to describe how an organization or individual "creates, delivers and captures value" (Osterwalder & Pigneur, 2010). The nine building blocks of the canvas include the key partners, key activities, key resources, cost structure, value proposition, customer relationships, channels of distribution, customer segments, and revenue streams.

› Changemaker.
An individual who is driven to creatively tackle an economic, social, or environmental problem. Changemakers take action, often through systemic interventions, to advance change for the purposes of simply improving society (Ashoka, 2016).

› Collective Impact Partnership.
Collective impact partnership refers to partnerships involving long-term commitments by a group of important actors from different sectors to a common agenda for solving a specific social problem. Their actions are supported by a shared measurement system, mutually reinforcing activities, and ongoing communications and are staffed by an independent backbone organization (Addy & Dubé, 2018).

› Community-based programming.
A cooperative process that involves a series of procedural tasks in which the community college serves as the leader and catalyst in effecting collaboration among people, their leaders, and other community-based organizations and agencies within its service area in identifying and seeking a resolution to major issues that are of critical concern to the community and its people (Boone, 1992, p. 10).

› Complexity.
The formation and reformation of patterns and structures whether in companies, research, and development teams, communities, or cities and nations (Brett, 2019, p. 19).

› Customer Development.
Customer Development is a value creation tool that encourages the student to consider, "What is the smallest or least complicated problem that the customer will pay us to solve?" (Blank & Dorf, 2012, p. 80).

› Design.
The ability to imagine that which does not yet exist to make it appear in concrete form as a new, purposeful addition to the real world (Nelson & Stolterman, 2012, p. 12).

› Design Thinking.
Design thinking is "a process of actions and decisions aimed at producing products, services, environments, and systems that address a problem and improve people's lives" (Boni et al., 2009, p. 409). The central tenets of design thinking are multi-disciplinary, human-centered, prototype-driven, and ideation-based (Patel & Mehta, 2017).

› Ecosystem Builders.
Individuals who drive long-term and system-wide change by supporting innovation and entrepreneurship in their region or community through (a) leading recognized startup ecosystem building initiatives, (b) running entrepreneurial centers and coworking spaces, (c) managing accelerators, incubators, or startup school programs, (d) serving in professional economic development or government roles, or (e) investors and serial entrepreneurs investing in building their local ecosystem (Horn, A. 2017). The Kauffman Foundation considers ecosystem building a "new emerging model for economic development in the "connected age" (Kauffman, 2021).

› Ecosystem Mapping.
A process involves developing categories of who is involved in the ecosystem and what role that individual plays.

› Effectuation.
Effectuation theory is a thinking framework and set of heuristics, which emphasizes taking action based on available resources for goal achievement (Sarasvathy, 2001).

› Emergence.
Outcomes that are unpredictable and seem to result from interactions between elements and which no one organization or individual can control (Kania & Kramer, 2013, p. 3).

› Entrepreneurship.
Entrepreneurship is "process of value creation" (Mishra & Zachary, 2014, p. 251). Entrepreneurs are "change-agents that bring that potential into reality, resulting in a wide variation in business performance and value creation" (Feld & Hathaway, 2020, p. 25). In the broader sense, entrepreneurship is the self-directed pursuit of opportunities to create value for others. By creating value for others, individuals empower themselves (G. Schoeniger, personal communication, July 15, 2020).

› Entrepreneurship Education.
Education is designed to enable an individual to make a unique, innovative, and creative contribution to the world through a value-creation mindset, whether as an employee or entrepreneur, regardless of the financial resources available (Bridge, 2017; Fiet, 2002).

› Entrepreneurial Ecosystems.
The geographically-bound systems of individuals, organizations, physical resources, social structures, and cultural values that generate new venture activity (Roundy, 2017, p. 1221).

› Entrepreneurial Mindset.
A cognitive process that empowers individuals to address problems and creatively generate ideas in uncertain environments (McGrath & MacMillan, 2000).

› Entrepreneurial Thinking.
Entrepreneurial thinking is "a mindset that emphasizes recognizing opportunity and learning to capitalize on it in a manner unique to the situation" (Patel & Mehta, 2017, p.518). According to Patel and Mehta (2017), entrepreneurial thinking's central tenets are collaboration, value creation, discovery-driven, and resilience.

› Honest Broker.
"Someone who builds networks of invested players that, with integrity, moves forward a common agenda to tackle persistent, large-scale social problems" (Catalyst2030, 2020a, p. 9).

› Hypocognition.
Lack of ideas required to solve the issue at hand (Lakoff, 2006, p. 76).

› Intrapreneurship.
Acting like an entrepreneur within an established company. It's creating a new business or venture within an organization. Sometimes that business becomes a new section, or department, or even a subsidiary spinoff (Somers, 2018). Intrapreneurship is also described as, successful adaptation of entrepreneurial attitudes and strategies inside of a bureaucratic organization. These entrepreneurial employees implement startup practices within a large organization, producing valued innovation (ASB, 2021).

› Logics.
The formal and informal rules of action, interaction, and interpretation that guide and constrain decision-makers (Ocasio & Thornton, 1999, p. 804).

› Multi-Stakeholder Initiatives.
Multi-stakeholder Initiatives (MSIs) are defined as voluntary and self-regulated groups of stakeholders from a variety of sectors in society, including government, business, civil society, international organizations, and academia, to address common issues (Bäckstrand, 2006).

› Multi-Stakeholder Leaders.
Founders or trained facilitators of the multi-stakeholder program who may hold any title as long as they are trained facilitators. These leaders are often recognized as experts in the programmatic subject matter by multi-stakeholder partners but take on the role of educator and facilitator for productive dialogue.

› Principal Investigator.
An influential entrepreneurial ecosystem actor, whose actions and behaviors shape and influence" economic and social change, often through activities involving research and complex multi-stakeholder engagement (Cunningham et al., 24016; 2019).

› Service-Learning.
Service-learning is "an organized educational experience that both meet needs of the community and fulfills learning objectives" (Steinke & Fitch, 2007, p. 24).

› Social Entrepreneurship.
Change agents with "innovative solutions to society's most pressing social, cultural, and environmental challenges. They are ambitious and persistent – tackling major issues and offering new ideas for systems-level change" (Catalyst2030a, 2020, p. 3). The mission of a social entrepreneur is to create and promote social value (rather or in addition to private value) through innovating, adapting, and continuous learning.

› Stakeholders.
Individuals with a "personal, professional, civic, or financial interest" concerning the school (Great Schools Partnership, 2014, p. 1).

› Starters.
A concept based on the premise that "We are all starters. All of us are born with an innate 'right to start,' to make an idea into reality" (Hwang, 2020, p. 5).

› Sustainable Development.
Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland Commission, 1987). This definition emphasizes social justice and human development for social and intergenerational (Lans et al., 2014) equity, especially for equitable distribution of resources.

› Sustainable Entrepreneurs.
Individuals who discover, create, and exploit entrepreneurial opportunities that improve social and environmental gains for members in society (Hockerts & Wüstenhagen, 2010; Pacheco et al., 2010; Shepherd & Patzelt, 2011).

› Sustainable Entrepreneurial Ecosystem.
An interconnected group of actors in a local geographic community committed to sustainable development through the support and facilitation of new sustainable ventures (Cohen, 2013, p. 3).

› Sustainable Entrepreneurship.
Discovering, creating, and exploiting entrepreneurial opportunities that improve social and environmental gains for members in society (Hockerts & Wüstenhagen, 2010; Pacheco et al., 2010; Shepherd & Patzelt, 2011).

› Systemic Innovation.
A set of interconnected innovations where each is dependent on the other, with innovation both in the parts of the system and in the way they interact" (Davies et al., 2012, p. 4).

› Systemic Innovation Lab.
A complexity-science informed solution ecosystem designed to imagine that which does not yet exist to make it appear in concrete form (Zivkovic, 2018; Nelson & Stolterman, 2012). The lab shifts between macro, meso, and micro levels of analysis and action.

› Systems Change.
"Addressing root causes rather than symptoms by altering, shifting, and transforming structures, customs, mindsets, power dynamics, and rules through collaboration across a diverse set of actors with the intent of achieving lasting improvement of societal issues on a local, national, and global level" (Catalyst2030a, 2020, p.3).

› Systems Social Entrepreneurs.
Practitioners with an entrepreneurial mindset who change by recognizing opportunities or applying new, innovative solutions to unsolved challenges. They are ambitious, persistent, proactive, comfortable with risk, future-oriented and display critical thinking skills, flexibility and adaptability. Their approaches emphasize collaboration and often involve human-centric design. They might run a for-profit business, but they might also opt for other ways to organize their efforts, including associations, advocacy organizations, foundations and movements. Taking a replicable, scalable approach to addressing societal challenges is core to their work.

› Systems Thinking.
Systems thinking is "a process of understanding interactions and influences between various components in a system to solve complex problems, by addressing every issue as a component of a larger system, rather than an independent aspect with non-related consequences" (Patel & Mehta, 2017, p. 517).

› Wicked Problems of Sustainability.
Complex, ill-defined, and interconnected social or cultural problems that can only be tackled by involving multiple stakeholders (Rittel & Webber, 1973). Wicked problems involve the long-term viability of organizations, societies, or human civilization (Batie, 2008; Weber & Khademian, 2008). Examples include poverty, homelessness, civic engagement, climate change, economic development, equality, clean water quality education, and hunger (SDGs).

The dissertation was inspired by the work of the late **Cabell Brand**, whose 2010 book was titled, *If Not Me, Then Who? How You Can Help with Poverty, Economic Opportunity, Education, Healthcare, Environment, Racial Justice, and Peace Issues in America.* In the book, he encouraged entrepreneurial changemakers to think globally but act locally. When I first met him, he was 90 years old. He asked what I wanted to accomplish and I told him that community college students deserved the best in entrepreneurial education so they could change the world. His calls after that meeting influenced my career and life trajectory. For that, I will always be grateful. As a board member of the Cabell Brand Center, I am also grateful to the other board members for continuing this work.

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