Strengthening the Chain: Using Symbiotic Relationships to Build Better Pathways to Higher Education

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Declining enrollments, financial/economic conditions and increasingly underprepared populations are just a few of the challenges facing Ohio universities today. This has led universities to develop new strategies toward the recruitment and retention of students. Some strategies, such as the Ohio P-16 initiative, have explored the use of business concepts such as supply chain management to develop new ways to approach the educational process. This paper will explore the grassroots efforts of how one regional campus is incorporating supply chain management concepts into the education process in a unique way. We will examine the effects this business model could have on educational efforts to better serve underprepared populations entering into the college realm. The effects on enrollment levels, persistence rates, and the overall long-term performance of students will also be discussed.

In 2010, college graduation rates nationwide hovered at approximately 38% for completion in four years and 58% at the six year completion mark (College Completion, 2010). For Ohio universities, this number dropped to 30% for completion in four years and 53% at six years. These reports did not go unnoticed, as evidenced by various initiatives which are underway to try to improve the outcomes. For instance, in 2010, President Obama announced the goal to increase the nation's graduation numbers by nearly 8 million graduates by 2020 (Nies, 2010). In an effort called "Project Degree Completion," nearly 500 of the nation's public four-year colleges committed to increasing the number of baccalaureate-degree holders by 3.8 million by 2025 (Kelderman, 2012). These initiatives seem to be having a positive impact. Recent reports by the National Center for Education Statistics (NCES, 2014) indicated that 59% of first-time, full-time students who began seeking a bachelor degree at a 4-year institution in fall 2006 completed the degree at that institution within six years. However, the NCES also noted that results varied greatly across institutions. For example, at 4-year institutions with open admissions policies, 33% of students

completed a bachelor degree within six years. This is a salient statistic for regional campuses in Ohio who primarily have open admissions policies.

Factors that not only contribute to the low graduation rates but also make it difficult for universities and colleges as a whole to achieve the national graduation goals included declining birthrates, increasing financial costs, changing economic conditions and decreasing levels of college preparedness (Rich, 2012; Amy, 2013; Pyle, 2013). The birthrate in Ohio has steadily declined by nearly 10,000 births every ten years beginning in 1990 (Ohio Department of Health, 2013). As a result, many public school districts across the state are experiencing decreasing enrollment (Rich, 2012). This is particularly alarming to higher education institutions (HEIs) whose enrollment depends primarily on traditional-aged, high school graduates. A decrease in the high school students transitioning to HEIs equates to fewer graduates, which makes the goal of achieving a specific number of graduates, in this case 8 million, a more difficult challenge.

Enrollment rates of students in HEIs are not only impacted by birthrates, but also financial and economic conditions. The number of students enrolled in college has long been seen as counter cyclical, rising when the job market is bad and declining when employment levels begin to rise (Amy, 2013). A recent report indicated that once the economy began to recover, enrollments began to decrease to pre-recession levels (Pyle, 2013). This impacted large universities, regional campuses, and community colleges alike. Consequently, many universities are faced with budget reductions. For instance, the University of Akron reported reductions of nearly $12 million, while Youngstown State University announced it was reducing its budget by $6.6 million (Pyle, 2013).

Another factor that impacts a student's likelihood to enroll, persist, and ultimately graduate from an HEI is his or her level of preparedness prior to entering into post-secondary education. In 2012, ACT released a report that stated that only 25% of ACT-test high school graduates met the College Readiness Benchmarks of all four areas listed here: math, English, reading and science (ACT, 2012). This lack of readiness has been extremely costly. In a 2011 article, a spokeswoman for the Ohio Board of Regents stated that Ohio spends roughly $130 million a year on remedial education at the post-secondary level (Fain, 2011).

Declining enrollments, financial/economic conditions, and increasingly underprepared populations are just a few of the challenges facing Ohio HEIs today. This has led many HEIs to develop new strategies

toward the recruitment and retention of students. Some strategies, such as the P-16 initiatives, approached the educational model as an integrated system of education stretching from preschool through a four-year college degree (Chamberlin & Plucker, 2008). The P-16 philosophy is intended primarily to smooth transitions between the different levels of education and identify ways in which value can be added at each stage of the process.

This article explores how the overarching philosophy of the nationwide initiatives like P-16 can be applied at a more local level. Specifically, we examined the grassroots approach of one regional campus in Ohio to address the obstacles of student under-preparedness in the education continuum through the lens of supply chain management.

Supply Chain Management Concept

The concept of adding value at each stage in a process has its roots in the domain of supply chain management. Supply chain management gained prominence in the field of manufacturing in the early 1980's (Lambert & Cooper, 2000). It has been broadly defined as the chain linking each element of the manufacturing and supply process from raw materials through to the end user (Scott & Westbrook, 1991; New & Payne, 1995) and as the integration of business processes from end user through original suppliers that provide products, services, and information that add value for customers and other stakeholders (Lambert, Cooper, & Pagh, 1998). The widespread adoption of supply chain management techniques over the past three decades has been driven by the desire for businesses to better meet the needs of their markets. The global benefits realized by such implementation are twofold: cost reduction and increased levels of service.

The concept of the supply chain is defined in this paper as the set of organizations directly linked by one or more upstream and downstream flows of products, services, finances, or information from a source to a customer (Mentzer et al., 2001). In a traditional business environment the process is most often comprised of a unidirectional chain of services which begins with the supplier of raw materials (upstream). The chain continues as the product progresses through each stage of production until it reaches the end user (downstream).

However, when applied to the service environment, these unidirectional, linear relationships were not as absolute. Sampson (2000) described this major difference as "customer-supplier duality." In other words, the customer is also the supplier of significant inputs to the service

production process. *Figure 1* depicts the duality in a service environment described by Sampson (2000).

Figure 1. Customer-supplier duality (Sampson, 2000).

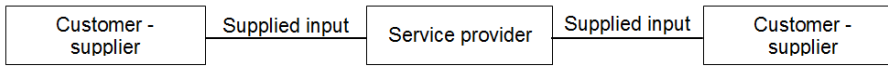
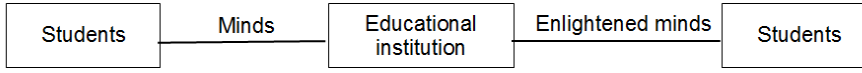


Figure 2 depicts this same supply chain when applied to a specific service industry such as education. In this case, the customer is the student. It is not the authors' intent to characterize students as "customers" in the educational process, but rather to indicate their position in the supply chain. Sampson (2000) suggested that an implication of the customer-supplier duality for supply chain management is that the production flow is bi-directional. As shown in *Figure 2*, the customer (student) provided the inputs to the service provider (education institutional) who then converted that input to an output (student). According to Sampson, there were implicit expectations at each stage in the process. Thus as each member in the chain received inputs from its suppliers, its goal is to add some degree of value. As a result, the relationships among members of the supply chain became symbiotic in nature, as the action of one member was to be mutually beneficial for each of the participants.

Figure 2. Customer-supplier duality in an education environment (Sampson, 2000).



Building Upstream and Downstream Relationships

Effective management of the supply chain requires attention to building value added relationships upstream and downstream. Downstream members of the educational supply chain include any stakeholder (individual, group or agency) that will receive a good, product, service or benefit that comes from an HEI. Habib and Jungthirapanich (2008) refer red to this group of stakeholders as consuming output customers which include graduates with desirable quality, family, employers, funding organizations of research projects, and research outcomes (i.e. researchers, research publications, findings etc.).

Efforts to address the needs of downstream members are evidences by the creation of commissions and legislation in hopes of helping college graduates have the skills and tools employers are seeking. For example, the State of Ohio created the Completion Task Force charged with providing "thought leadership for the development and implementation of a comprehensive agenda to increase the number and percentage of students earning meaningful credentials at Ohio's public postsecondary institutions" (Complete College Ohio, 2013).

Upstream members of the educational supply chain include any individual, group or agency that supplies students to an HEI. This is a broad group, as there are many sources from which students may originate. These groups can include employers encouraging their employees to return to school for additional training, transfer students from other HEIs, or from articulation pathways built between neighboring HEIs. The focus in this paper is on the upstream member which represents one of the largest sources of students for HEIs, the high school.

A review of the literature on upstream initiatives revealed a number of programs underway which directly target the high school market. These include: the Promise Neighborhood Initiative (Hudson, 2013), dual credit programs (Watt-Malcolm, 2011), articulation agreements (O'Meara, Hall, & Carmichael, 2007), and Secondary School Apprenticeship (SSA) programs (Watt-Malcolm, 2011). Although each of these upstream initiatives serves a common purpose of connecting students to an HEI, they differ slightly in their approach. For instance, SSA programs allow students to gain work experience, earn a limited amount of college credit, and earn hours that can count toward an apprenticeship while receiving an income (Watt-Malcolm, 2011). In contrast, articulation agreements typically connect one HEI to another HEI by enabling "a student to complete a program of study at one institution and, using accumulated credits, attain a degree at another institution in a shorter period of time" (O'Meara et al., 2007, p.10).

Although dual credit is an upstream initiative, it may also be viewed as a form of backward integration whereby the boundaries between courses, resources, or curriculum of an HEI begin to blur with the K-12 curriculum. The most widely recognized form of this integration is currently in the form of the Post-Secondary Enrollment Options Programs (PSEOP) which were designed to provide qualified public high school students with the opportunity to enhance their high school education by taking college level courses.

A Gap Remains

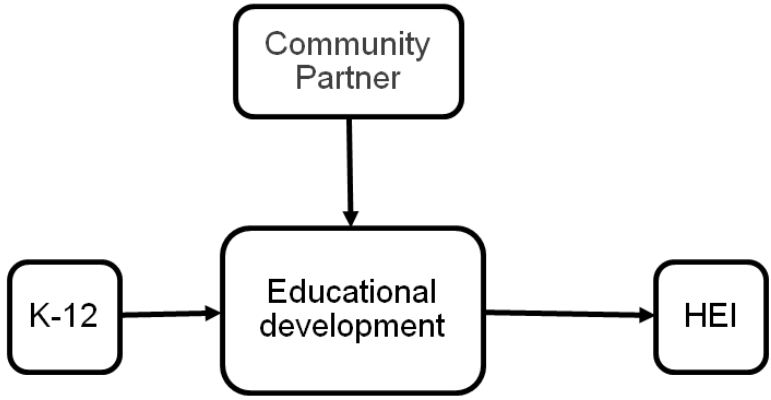
Despite the widespread attention being paid to supply chain management in higher education, our review of upstream initiatives suggested that a gap still exists. Specifically, many upstream initiatives such as dual credit or PSEO programs are aimed at the high achieving students only. However, this one-sided methodology to policy formation at both the State and institutional levels had rewarded students that are already successful academically, yet may *unintentionally* have neglected the diverse needs of many disadvantaged students.

In terms of the educational supply chain, HEIs (upstream) are affected by this gap. In particular, most regional campuses in Ohio have open enrollment policies and are therefore more likely to be impacted by those students who are underprepared. The issues of remediation and under-preparedness extend beyond the classroom to the budgets. As mentioned earlier, the State of Ohio had spent approximately $130 million a year on remedial education at public institutions of higher education (Fain, 2011). Consequently, two questions that arise for these regional campuses are "Can anything be done to raise the level of preparedness of students on a local level?" and "Can the existing supply chain be better managed?"

Creating the Symbiotic Relationship – A Grassroots Approach

Partnering with an organization that works with underprepared and disadvantaged students at an early age is critical for higher education institutions (Oakes, 2002). Other research indicates that "early public investment in disadvantaged children in terms of earning gains show that these may be as high as 15-17 percent per dollar invested" (Silburn & Box, 2008). Based on these research findings, we propose that Sampson's supply chain model can be transformed to include a third party. However, we believe that the sustainability of a supply chain in higher education that is reframed to include third parties necessitates the presence of symbiotic or mutually beneficial relationships. *Figure 3* illustrates how a third party, such as a community partner can be integrated into the existing supply chain to moderate the value chain relationship between the education development at the K-12 level and the graduating student. Further, we propose that high levels of community partner involvement in the educational development process results in higher levels of educational development.

*Figure 3***.** Third party value provider.



Over the past four years, the Trumbull Campus of Kent State University, located in Warren, Ohio has taken steps to integrate a third party into the educational supply chain by creating symbiotic relationships that add value. The campus used a multi-faceted approach which involved a campus student organization and academic departments to establish a relationship with a nonprofit agency known as Inspiring Minds, located in Warren, Ohio. The mission of the Inspiring Minds organization is to engage, inspire and empower youth to reach their full potential through education and exposure to life-changing experiences (Inspiring Minds, 2014). Inspiring Minds offers local youth different programs in a safe environment that augments and supports learning. Students that participate in Inspiring Minds programs are given countless opportunities through programs and after school activities to better improve student skills in STEM areas, financial literacy, professional development and entrepreneurship (Inspiring Minds, 2014). Because of the types of services they offer and their target audience, Inspiring Minds had established relationships with the local K-12 schools systems. *Figure 3* illustrates that the connection between an HEI and the third party, in this case Inspiring Minds, can be another pathway by which to reach and add value to the students' educational process.

The Kent State Trumbull student organization, known as Enactus, is a "community of student, academic, and business leaders committed to using the power of entrepreneurial action to transform lives and shape a better more sustainable world" (Enactus, 2014). The student group takes on numerous projects each year with the overarching goal of utilizing entrepreneurial approaches and business principles to benefit the lives of

others in the local community. By working with the faculty and campus administration, the Enactus group developed projects for Inspiring Minds' after school program for high school students. Each project was designed to help improve the students' skill set in areas that would help them be more successful at the next stage in their academic or professional career.

One of the projects was a semester long series of job readiness workshops, where the students engaged in resume writing and mock interviews. They also learned about various elements of business etiquette, such as proper attire. Another project that resonated with the group was financial literacy. In these sessions, the students not only learned about managing their own money, they also had the opportunity to take on the role of financial advisors and teach others. Each of these projects exemplified the value that can be found when the relationship between members of a supply chain is truly symbiotic in nature. In this instance, the student's education was augmented through their participation in the Inspiring Minds program. Additionally, the Kent State Trumbull Enactus students needed to identify projects that they could use entrepreneurial approaches and business principles to better serve the community. These projects enriched the educational experience of Kent State students by providing a mechanism by which they could extend their classroom experience in a real-life business application. Thus, the formation of a symbiotic relationship produced substantial benefits for the student organization, non-profit agency, Kent State University at Trumbull, and the local community.

Inspiring Minds also wanted to improve the math readiness levels of students that attended their programs, but did not have the resources to achieve this goal. Through collaboration with the Kent State Trumbull math department and Learning Center, Inspiring Minds was able to offer students access to the ALEKs computer based math program. ALEKs, whose name is an acronym which stands for **A**ssessment and **Le**arning in **K**nowledge **S**paces, is a web-based, artificially intelligent assessment and learning system (What is ALEKs, n.d.). The initial results of the program are promising. Based on a six week testing period in the summer of 2013, ALEKS Math scores for Inspiring Minds' students in grades 6^{th}-8^{th} showed a 23% average improvement, while high school students showed an average improvement of 14%. Students in grades 3-5 achieved an average improvement of 29%.

Recommendations

The sustainability of a supply chain in higher education that is reframed to include third parties necessitates the presence of symbiotic or mutually beneficial relationships. Therefore, recommendations that HEIs should consider when thinking of implementing supply chain management principles are:

- Examine partnering organizations' missions, goals, strategic and marketing plans, services provided, target populations, community involvement and outreach, budgetary goals and restrictions to build context for identifying mutually beneficial goals.
- Establish mutually beneficial goals with measurable outcomes at the onset of the relationship. All parties must feel that the value being added to the process is desirable or the relationship would not be sustainable.
- Obtain leadership support from all partnering organizations.
- Utilize a multifaceted approach whenever possible. This is based on the principle that many legs form a sturdy table. When many departments or groups within an organization are involved, it becomes more likely that value can be added to the mutual satisfaction of all parties.
- Assess and evaluate the relationships within the supply chain often. Do not be afraid to change the relationship at any time even if it means severing ties. If goals are not being achieved and the partnership is not reaching the measurable outcomes then there must be either a reexamination of measurement tools and goals, or the partnership may be considered for termination. Partnerships should be mutually beneficial not parasitic. In other words, institutions do not want to partner with organizations that drain valuable resources. Good measurement and evaluation forces partners to reflect and recognize whether or not the partnership is parasitic.

Future Directions

While this paper serves to illustrate how supply chain management practices can be applied to the college and university setting using a grassroots approach, it does not fully encompass the benefits this business concept could have on the entire education process. Future research in this area is needed to measure the impact third party value providers in the

supply chain have on the students' level of preparedness. Furthermore, additional research centered on the utilization of business concepts within higher education that involve efforts to increase productivity, transparency, collaboration, efficiency and simplicity; while curtailing complexity, redundancy, and the silo-effect felt by many HEIs is also needed.

Personal Biography

Susan Emens, Ph.D. is an Associate Professor in Business Management Technology in the Regional College at Kent State University. She is currently serving as the Interim Assistant Dean of Academic Affairs for Kent State University at Geauga and the Regional Academic Center in Twinsburg. As a faculty member at the Trumbull campus for Kent State, Dr. Emens, along with her co-author Jacob Roope, served as advisors for the Enactus student organization. Jacob Roope currently serves as an academic advisor in the College of Education, Health & Human Services at Kent State.

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