Chapter 12
Towards a New Understanding of Labor Market Alignment

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Introduction

Higher education's role in preparing students for the workforce is a mounting concern among policymakers and the public at large. The majority of Americans view a college education as essential to getting a good job (Gallup-Purdue Index, 2014), recognizing that the wage premium for a college degree has risen in recent decades (Autor, 2014; Baum, Ma, & Payea, 2013; Pew Research Center, 2014). At the same time, press reports have highlighted the struggles recent college graduates have had finding well-paid jobs that use their education (Arum & Roksa, 2014). These concerns about post-graduates' employment are particularly troubling given the rising price of college and high levels of student debt (Fry, 2014; Lee, 2013). In addition, employers report difficulties finding enough skilled workers among college graduates, reflecting potential, though debatable, skills shortages in certain fields (Beaudry, Green, & Sand, 2013; Holzer, 2013; Rich, 2010; Sherrill, 2013; Weaver & Osterman, 2013).

Given this context, recent federal policy developments demonstrate a commitment to ensuring the nation's postsecondary systems are connected to the needs of the labor market. Vice President Biden clearly articulated the importance of ensuring that education is jobs-driven to create a better match between graduates' training and the needs of employers (Biden, 2014). Likewise, the Workforce Innovation and Opportunities Act emphasizes the importance of engagement between education and employers ("Workforce Innovation Opportunity Act," 2014). These recent

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M.B. Paulsen (ed.), *Higher Education: Handbook of Theory and Research*,
Higher Education: Handbook of Theory and Research 32,
DOI 10.1007/978-3-319-48983-4_12

policy developments add to growing policy attention at the federal level and among states about how higher education prepares its graduates for employment (National Governors Association, 2013; US Department of Labor, 2014).

At the same time, conversations and research within the higher education community have focused increasingly on student success, as measured by student outcomes (Witham & Bensimon, 2012). Concerns about whether students complete a degree or credential and how quickly and efficiently they do so now dominate postsecondary research. This conversation, which is focused on the "completion agenda," has not been connected to the concurrent discussions about labor market alignment (i.e., what happens after completion). Few discussions of how workforce development and/or career readiness relate to student success exist (see D'Amico, 2016; Myran & Ivery, 2013). This disconnect raises questions about what policymakers and other stakeholders mean when they call for higher education to align with the labor market. In addition, questions about the function of higher education and its role in preparing students to join the workforce emerge.

In light of these questions and with research and policy on both issues accumulating in the absence of an understanding of how they connect, we provide a preliminary conceptualization of the role higher education plays in labor market alignment (LMA). We also offer a critique of the current discourse that suggests LMA is a straightforward and one-dimensional process with clear, agreed upon goals. Instead, we argue that the alignment of higher education with the labor market is best conceptualized as an organizational learning process that a range of actors engage in as a process of goal negotiation with the purpose of improving students' postgraduation workforce success and achieving myriad goals congruent with the unique institutional missions and needs of various educational sectors and employers. Our focus on the specific role of higher education in alignment discussions and our broad approach are unique; others (Carnevale, 2010; Perna, 2013) have separately considered policy and practices to support alignment and may call for a balance between "postsecondary education's growing economic role and its traditional cultural and political independence from economic forces" (Carnevale, Smith, & Strohl, 2010, p. 119) but none consider the diversity of American postsecondary education models or the active participation of all higher education institutions in the alignment process.

To make our argument, this chapter is organized into eight sections. The first section draws upon literature on the history of LMA in higher education, providing an overview of the role that LMA has played in higher education over time. Next, we discuss the key drivers of LMA, including the influence of neoliberal political thought, the economic pressures that change external demands on higher education, and concerns about the supply of skilled labor. In the third section, LMA is situated within a number of sometimes competing theories from the scholarly literature. The fourth section provides a new framework for understanding LMA that is based in organizational learning theory and, unlike prior work, accounts for the balancing of competing interests that is a key feature of LMA efforts. The fifth section explores current approaches to LMA in higher education in more depth, while the sixth section more uses organizational learning theory to discuss the myriad approaches to

LMA that currently exist and the importance of eschewing a one-size-fits-all approach. In the seventh section, we identify and explore unanswered questions about how to measure LMA and in the final section we provide readers with a summary and identify needed research on this new conceptualization of LMA.

History of LMA in Higher Education

Labor market alignment has a long history in higher education. Literature on workforce and economic development, career pathways, work-based learning, vocational education, labor markets, higher education institutions, student employment outcomes, student career choice and career development, and several others offer myriad examples that can be described under the umbrella of higher education LMA. In this section, we draw from some of these streams, though others are discussed throughout the chapter in other contexts, to provide a broad overview of how LMA has been addressed in the context of the American higher education system. We do not explore the various federal programs that are focused solely on job training and workforce development if they are not explicitly tied to public education.

Workforce development, or the educational preparation of workers for occupations, permeates the history of American colleges and universities (D'Amico, 2016). It became an earnest pursuit, however, beginning in the nineteenth century. While higher education in the United States has its roots in preparing the elite classes with the moral, intellectual, and civic learning required to become good citizens and civic leaders, the founding of institutions such as West Point (1802) and Renssellaer Polytechnic (1824), signaled the emergence of a more vocationally-oriented college. In 1862, Congress created the Morrill Act to create land grant universities in states to address the educational needs of state agricultural and industrial interests. However, these colleges, many of which became the state universities we know today, continued to operate with a largely liberal arts curriculum that had been shaped by the older versions of the university system, making them difficult to distinguish from other types of colleges. Around the same time, "multipurpose" colleges that trained women to be teachers and others to enter jobs in science, agriculture, and other industries began to emerge, setting the stage for colleges that focused on aligning their curriculum with the needs of a range of local employers (Grubb & Lazerson, 2012).

In the late nineteenth and early twentieth centuries, more higher education institutions began to establish direct links with particular occupations through optional professional education. Programs for doctors, lawyers and others surfaced, and over time employers began to see these degrees as requirements rather than optional learning (Kett, 1994). Whereas in the past, employers saw little value in relying on higher education to train workers (Grubb & Lazerson, 2012), this shift toward required professional education established a clearer place for universities in serving the workforce education needs of the labor market. The broad movement toward providing specific education for occupations is known in the research literature as

vocationalism (Kliebard, 1999; Lazerson & Grubb, 1974). Vocationalism also refers broadly to the idea that the purpose of education is to ensure students are prepared for work (Kliebard, 1999).

In the 1950's, policymakers began to push for increased focus on providing publicly-funded occupational training through community colleges as a means to promote economic development and attract businesses (Brint & Jerome, 1989; Dougherty, 1994). More recently, for-profit colleges, such as the University of Phoenix and Devry, have developed to take advantage of employer-provided tuition reimbursement and other types of financial aid, while community colleges have developed robust noncredit and customized training programs to serve occupational needs in addition to an array of occupational majors offered for credit (Iloh & Tierney, 2013; Jacobs & Dougherty, 2006).

Although federal support for college programs designed to prepare students for employment existed in the early twentieth century (Cohen & Brawer, 2013), the Vocational Education Act, passed in 1963, and subsequent amendments and appropriations, resulted in broader aid to schools; this support developed vocational options in postsecondary education in ways previously unrecognized. One of the most notable examples of federal support for vocational education is the Carl D. Perkins Vocational Education and Technology Act, first authorized in 1984, the purpose of which was to improve the quality of vocational education in support of the economy. It has significant influence on alignment with higher education because of the substantial funding (over $1 billion) and its stipulation that programs of study must connect academic and technical curricula across secondary and postsecondary education, thereby explicitly highlighting the role of colleges in preparing students for the labor market. The latest reauthorization in 2006 specified support for career pathways, which link educational coursework from as far back as elementary school through college to particular occupations or clusters of occupations.

Beginning with a report from the Secretary's Commission on Achieving Necessary Skills (1991), known as the SCANS report, numerous public reports have asserted that most, if not all, workers now need higher order thinking skills. These include problem solving and critical thinking skills, as well as technical skills and "soft skills" in communication and teamwork, to succeed in *most* jobs. Employers across the economic spectrum are seeking workers who have these new, foundational "Twenty-first Century skills." Reacting to such findings, policy reports such as Measuring Up On College-Level Learning (Ewell & Miller, 2005) and the 1998 report from the Boyer Commission on Educating Undergraduates in the Research University (Boyer, 1998), call for broad reforms in education that build students capacity to learn effectively through critical thinking and problem solving. Like the SCANS report, they urge higher education to integrate the teaching of "Twenty-first Century skills" into all curricula. Postsecondary institutions, they argue, need to find ways to ensure all graduates obtain the core skills needed to succeed in today's global, technologically advanced labor market. More recently, efforts such as the Hewlett Foundation's Deeper Learning initiative (Hewlett Foundation, 2014) and the Lumina Foundation's broad competency based Degree

Qualifications Profile initiative also emphasize broad rather than specific vocational education approaches in higher education (Adelman, Ewell, Gaston, & Schneider, 2011; Conley & Gaston, 2013).

Policies around the school-to-work transition sought to establish systems within education to prepare students for careers. In 1994, Congress passed the School-to-Work Opportunities Act (STWOA) to "clarify the connection between school and work and in response to the perception that Americans too often entered the workforce without the basic skills they needed" (Javian, 2004); it provided funding that supported the integration of job training for the workplace into the classroom. While much of STWOA focused on secondary schools, some STWOA approaches, such as programs offered through Tech Prep, included options for dual enrollment that created pathways from high schools to community colleges in occupationally focused areas. STWOA provided a notable emphasis on developing systems to support the transition to work. However, these systems have not been directly addressed at a broad scale since that time.

In the immediate aftermath of STWOA, policy focus shifted to a "College for All" approach (Rosenbaum & Jones, 2000). Rather than focus on helping secondary students explore careers and develop skills and experiences to transition to the workplace, policy focus has been on promoting college attendance. Since the 1990s, with wages falling and employment prospects narrowing for high school graduates (p. 359), coupled with a rise in the "college premium", policymakers have paid increasing attention to encouraging more students to enroll in college; thus, fewer students directly transition from high school to work, so the current locus of understanding this transition must be on the college to career transition. As Carnevale (2010) noted, "school to work has been supplanted by school to college" (p. 6). Students increasingly seek to enroll in college immediately after high school, regardless of their academic preparation and often without an understanding of their career goals. Given this shift from school-to-work to school-to-college, the challenge of transitioning students from education to jobs has functionally been transferred from high school to colleges.

More recently, for many reasons further discussed below, the public is increasingly focused on the role of higher education in preparing students for jobs. A number of reports urge colleges and universities to focus on preparing students for specific jobs, or industries. In a report by the Council of Economic Advisers (2010), the authors point to growth projections in healthcare, construction, and manufacturing and call on postsecondary educational institutions, especially community colleges to be "responsive to the needs of the labor market" as a way to assist unemployed workers to reconnect to the economy and to spur economic recovery overall. Today, many policy stakeholders are promoting "Career Pathways" programs. A Report from The Alliance for Quality Career Pathways (CLASP, 2013) states that career pathways are "well-articulated sequences of quality education and training offerings and supportive services that enable educationally underprepared youth and adults to advance over time to successively higher levels of education and employment in a given industry sector or occupation" (p. 1). As Newman and Winston (2016) argue, America has an increasing need to consider strengthening its

infrastructure to prepare students for employment in middle skill jobs, rather than pushing all students to pursue four-year college degrees.

Yet, currently there remains a lack of consensus in higher education about the role of colleges and universities in preparing students for work. Vocationalism, while prevalent in higher education, is by no means universal. In 2011, nearly 50 % of all college presidents reported that providing the "skills, knowledge, and training" needed for work was the most important goal for colleges. Not surprisingly, though, presidents from two-year and for-profit colleges were more likely to emphasize workforce preparation over other missions. Over two-thirds of community college and for-profit college presidents stressed workforce preparation first, while only 30 % of four-year college presidents cited this as their primary mission over intellectual and personal development (Parker et al., 2011). Indeed, there appears to be "no collective voice from within [higher education] that would define what teaching seeks to achieve and how to evaluate and improve its effectiveness." (Zemsky, 2012, p. 1) Furthermore, as Barghaus, Bradlow, McMaken, and Rikoon (2013) note, there is little consensus on what it means for our schools to "prepare and make students ready" to enter the workforce. Their "survey of extant literature suggests that there is no general agreement on (a) what it means for a student to be ready; (b) what skills are required for readiness, recognizing that the literature tends to separate skills into generic and specific (Bennett, Dunne, & Carre, 1999); (c) the best practices to get students ready; and (d) the outcomes that would indicate a successful workforce readiness program" (p. 37).

Despite a long history of grappling with the issue of workforce development, higher education continues to struggle with whether or how to implement it. Tensions continue within and among institutions regarding how to best achieve workforce preparation and how to balance these aims with the enduring tradition of providing a liberal education for intellectual and personal growth and general civic preparation. On the other hand, the persistence of attempts in higher education to better serve students as they transition from college to work through some type of LMA effort demonstrates the continued value that higher education leaders, policymakers, and the public place on the importance of helping students succeed in multiple areas of their lives after college, including work. As we explore later in this chapter, the varied and shifting LMA approaches that emerge from this desire to help students is a result of complex negotiations between competing stakeholders.

Key Drivers of LMA in Higher Education

A wide range of social problems give rise to policymakers' calls for LMA, including unemployment and underemployment of college graduates, rising student debt, and perceptions of lagging business and national competitiveness. One's fundamental understanding of the drivers of these problems, however, can shed light on how a variety of perspectives and policies on LMA have developed. There are several key trends and social and political movements that have influenced the evolution of

labor market alignment and the political dialogue on the role higher education should play in the labor market. We explore three of these trends: neoliberalism, economic pressures driving change in higher education, and concerns about the supply and demand for skilled labor in the job market.

The Influence of Neoliberalism

The re-emergence of nineteenth century neoliberalist political philosophies in the 1980s and 1990s reinforced the development of LMA policies and approaches. A neoliberal perspective on education suggests that a free market approach to education provides fair and equitable competition with little interference from the federal government (Apple, 2001); colleges and universities are subject to and improved by the invisible hand of the market. Government's limited involvement is only in creating the structures and policies to allow a market to function; in this way, government supports business and national economic interests (Ayers, 2005). Education becomes an extension of the government because policies act through education rather than directly from government intervention; in his analysis of community college mission, Ayers (2005) suggests that "government becomes responsible for unemployment only through its involvement in education [and education becomes an] arm of economic policy and other responsibilities traditionally associated with postsecondary education such as intellectual and social development become secondary" (p. 537). The market is viewed as a context for rational choices with a dependence on evidence through performance indicators and increasing standardization (Apple, 2001).

While higher education has long been connected to preparing people for work in some form, human capital theory provided a strong economic justification for neoliberal LMA policies. Human capital theory, which we will discuss in more detail later in this paper, views education as designed to convey skills and abilities needed by workers in society and holds that those workers with higher levels of educational attainment typically have greater skills and abilities and thus deserve—and obtain—higher economic rewards (Becker, 1993; Mincer, 1958; Schultz, 1961). Through this perspective, when people obtain more education, they gain more skills and therefore receive higher wages. At the same time, those new skills have spillover benefits to employers and the wider community. Through this lens, higher education can be seen as an economic panacea of sorts, providing the foundation for neoliberal LMA policies.

Although human capital theory provides evidence of economic returns to education, it does not, in and of itself, justify the prioritization of economic goals in higher education over other types of goals, such as social equity, and intellectual and civic development. Neoliberalism, however, places a clear priority on promoting economic goals over other goals. In doing so, it provides a strong base from which policymakers and others can support LMA policies, which are intended to improve economic outcomes for participants in the economy.

Critics of neoliberal policies in higher education, however, point out the trade-offs society faces when a human capital perspective becomes the dominant force in higher education. Human capital theory suggests that education is valued because of its return on investment—its development of human capital—and not for its social role in an egalitarian society (Ayers, 2005). Thus, neoliberalism's embrace of the human capital perspective alters the meaning of education "so that it serves the interests of those in the upper social strata" (Ayers, 2005, p. 528). The critics of the neoliberal perspective argue that economic policies that promote a market perspective, in which entrepreneurs are valued, reinforce existing hierarchical social structures that the upper class is able to navigate. As such, education no longer fills goals of general citizenship or social mobility (Labaree, 2003). As higher education moves towards vocationalization, critics argue, civic education and other important goals of education are lost.

Understanding these sharply conflicting perspectives on higher education's role vis a vis the economy, it is easy to understand why LMA can be a controversial subject in higher education. The positioning of the neoliberal and critical arguments conjures fundamental questions about whether higher education can balance civic and equity missions while also addressing the economic demands of students and businesses. As we shall explore in more depth later in this chapter, we believe that there are ways to find balance in these sometimes conflicting missions, allowing colleges to assist students to succeed in many ways, including economically, after graduation.

Economic Pressures on Higher Education

As a reflection of these neoliberal trends, today, a number of evolving indicators suggest that social expectations about a college education are shifting. Students, parents, and other private and public funders of higher education increasingly expect that a college degree will lead to a well-paying job (Mourshed, Farrell, & Barton, 2012; Pew Research Center, 2014). At the same time, many employers have reduced the amount of training for entry-level workers while raising expectations that students will develop more work readiness skills while in school (Bishop, 1994; Cappelli, 1999, 2011, 2012; Reich, 1992; Ruby, 2013; Tejada, 2000). Marshall and Tucker (1992) note that most criticisms of education in the U.S. focus on low academic attainment and the resulting effects on economic competitiveness, which is a growing concern for employers and policymakers in our global economy. These changes have resulted in a rising tide of discourse calling for LMA, which is pushing colleges and universities to adapt in order to accommodate the economic needs of students, employers, and communities.

At the same time, students, parents, and other private and public funders of higher education increasingly expect that a college degree will lead to a well-paying job (Mourshed et al., 2012; Pew Research Center, 2014). The premium to college wages has grown in recent years (Baum et al., 2013; Pew Research Center, 2014).

This finding adds to well established evidence of the economic benefits of higher education. College graduates on average have higher lifetime earnings (Angrist & Chen, 2011; Carnevale, Rose, & Cheah, 2011; Oreopoulos & Petronijevic, 2013) and lower unemployment rates compared to those with no college degree (Abel, Deitz, & Su, 2014; Stone, Van Horn, & Zukin, 2012). However, some research suggests that despite the strong returns to a college education, the employment prospects of college graduates are somewhat diminished as students face difficult transitions to the workforce (Abel et al., 2014; Stone et al., 2012).

The rising cost of higher education further intensifies the desire to demonstrate strong connections between a college education and a well-paying career. Cutbacks in public funding for higher education and rising tuition have intensified concerns about post-graduation earnings because of higher levels of student debt (Fry, 2014; Lee, 2013). With federal government estimates of student loan debt surpassing one trillion dollars, policy makers and consumers are particularly interested in making sure that a college education remains a good investment leading students to good careers (Chopra, 2013). Even though a college education remains a good investment, despite rising costs, these concerns intensify the pressure on higher education to clearly articulate how college prepares students for the workforce.

Concerns About Labor Supply

The nature of job demand plays an important role in shaping policies and perspectives on LMA. There are competing ideas in the scholarly literature regarding whether there are shortages of skilled workers for some highly skilled jobs, or whether there is, instead, an oversupply of skilled workers relative to employer demand. Further, there are disagreements about what is causing these respective labor supply and demand shortages, which in turn frame stakeholder approaches to LMA. Concerns regarding labor shortages have two main, inter-related branches. First, there is the concern that there will be a shortage of workers for all types of jobs brought about by demographic shifts in the labor market. Second is the concern that there will be a shortage of skilled workers in some types of jobs, generally thought to be caused by inadequacies in the U.S. education pipeline.

One related assumption is that there will be a general tightening in the job market due to broad demographic shifts. As the large population of Baby Boomer workers retires and the labor market experiences slower than usual growth, this theory posits, there will not be enough people in the labor force to fill replacement jobs and drive continued economic growth (Judy & D'Amico, 1997; Lerman & Schmidt, 1999). This view has been widely disseminated in industry and policy circles. According to Richard Freeman's (2006) review of the labor shortage claims, a number of largely non-academic groups and media outlets interpreted labor force projections data from the U.S. Department of Labor to draw these conclusions and to disseminate the ideas widely, including the National Association of Manufacturers, The U.S. Chamber of Commerce, industry trade magazines, Fortune and Time

magazine, and the Aspen Institute. Even following the Great Recession of 2008, some groups continue to warn of an impending general labor shortage. The Conference Board (2015) warns businesses that despite the recent slack in the job market driven by the recession, the underlying demographic trends of looming retirements and slow labor force growth continue to threaten business competitiveness, especially in some states where these demographic changes are expected to be more severe and less mitigated by immigration. Bloomberg reported that businesses should brace for the fact that the, "global pool of young workers ages 15–24 is contracting by about 4 million per year" (Miller & Chandra, 2015).

Despite the fact that these labor shortage theories predict a general shortage of U.S. workers to fill all jobs, many claims about labor shortages focus on difficulties employers report in attracting U.S. workers into jobs in the sciences and engineering (Freeman, 2006) or other industries that require high levels of education or skills (e.g. Eisen, 2003). In this case, the shortages are often attributed to various shortcomings in the U.S. education system (Institute of Medicine, et al., 2007; Government-University-Industry Research Roundtable of the National Academy of Sciences, 2003).

While labor shortage theories are popular in the media and business and policy circles, a growing number of academics are taking issue with them. Richard Freeman (2006) of the National Bureau of Economic Research argues that a general labor shortage is unlikely because (1) the logic underlying labor shortage theories wrongly assumes unflagging levels of GDP growth and does not adequately account for global labor markets; (2) future projections of employer skill demands are currently unreliable; and (3) demographics have not significantly affected the labor market in the past. Salzman & Lowell (2007) also found no evidence of a skilled worker shortage in a range of STEM industries. They noted that rising wages, a traditional economic indicator of labor shortages, have not been seen to a significant degree in STEM occupations. Similarly, Osterman & Weaver (2014) found that firm policies and other mediating factors, not a shortage of skilled labor, led to some employers having hiring difficulties.

Theoretical Perspectives on LMA

As the field of higher education grapples with the meaning of LMA, several existing areas of scholarship provide insights that aid in that understanding. The concept is not a simple one and because of this complexity, we introduce three broad lenses that help illuminate the competing perspectives and goals that simultaneously exist in LMA. These perspective include: human capital theory on the role of education in the economy; signaling, screening, and conflict perspectives on the role of education in the economy; and institutional perspectives on the school-to-work transition.

Human Capital Theory

Human capital theory lays the groundwork for the study of the relationship between higher education and the labor market. It was first introduced in the field of economics in the late 1950s and early 1960s to explain the relationship between education and wages (Becker, 1993; Mincer, 1958; Schultz, 1961). Human capital was originally defined by Becker (1993) as "activities that influence future monetary and psychic income by increasing the resources in people" or investments that "improve skills, knowledge, or health" (Becker, 1993, p. 11). Engel (2000) subsequently offered the following definition: "the stock of knowledge and skills possessed by the labor force that increases its productivity" (Engel, 2000, p. 24). The theory presumes that employers and other aspects of the community also benefit economically from higher education as skilled workers produce more value for employers and society at large.

Much of the study of human capital has focused on education, particularly formal education, largely because of the availability of data on the attainment of educational credentials and earnings. Becker (1993) states that there is a lot of circumstantial evidence for human capital, but "probably the most impressive piece of evidence is that more highly educated and skilled persons almost always tend to earn more than others" (p. 12). According to Schultz (1961), "the investment period of education can be measured by years of schooling, but the periods of on-the-job training, of the search for information, and of other investments are not readily available" (p. 66). In measuring human capital, he discusses the importance of distinguishing "human investments" from "consumption". Because it is hard to distinguish from consumption when looking at expenditures, he argues for examining economic returns: "While any capacity produced by human investment becomes a part of the human agent and hence cannot be sold; it is nevertheless 'in touch with the market place' by affecting the wages and salaries the human agent can earn. The resulting increase in earnings is the yield on the investment." (p. 8). Thus, the key evidence used to support human capital theory is increasing earnings for increasing amounts of formal education. These earnings, in turn, provide policymakers with the justification for pushing LMA policies as a way to promote economic development that benefits individuals, businesses, and communities.

Human capital theory distinguishes between two main types of education, general and employer-specific or on-the-job training. To distinguish between general formal education and on-the-job training, Becker (1993) defines school as "an institution specializing in the production of training, as distinct from a firm that offers training in conjunction with the production of goods" (p. 51). However, he acknowledges that there may be overlap in their functions: "Schools and firms are often substitute sources of particular skills" (p. 51). General training is viewed as the worker's responsibility because it yields human capital that could be taken to other firms. In contrast, employer specific training is viewed as the responsibility of the employer because it increases productivity in the employer only and is not transferable.

According to Becker (1993), education and training are "the most important investments in human capital" (p. 17). He argues that the expansion of high school and college education is because of the additional knowledge and information required in technologically advanced economies. He cites Denison's (1985) analysis that indicates one-quarter of US economic growth from 1929 to 1982 is due to increases in schooling of the average worker. Taking this into account, it is not difficult to see how policy stakeholders could use the basic ideas of human capital theory to justify investments in higher education LMA as a solution to shortages of both skilled labor and labor demand. Human capital theory, after all, suggests that supporting more individuals to complete higher education, a form of LMA, can both raise wages for workers and stimulate economic growth by providing the economy with a better skilled workforce, which has more production power. Fundamentally, human capital theory promotes the connection between higher education and the labor market that underpins many understandings of LMA.

Screening, Signaling & Conflict Perspectives

Screening and signaling theories provide a different perspective on the value of education in the hiring process than human capital theory. Both theories challenge the fundamental basis of human capital theory that educational credentials represent technical skills related to work. Rather, signaling and screening theories posit that instead of representing these skills, educational credentials represent other characteristics that employers value, such as motivation or the ability to learn (Arrow, 1973; Spence, 1973; Stiglitz, 1975). According to signaling theory, because individuals who seek further education have more of these qualities, employers value educational credentials in the hiring process (Spence 1973). Likewise, screening theory argues that educational credentials indicate workers have the qualities that make them valuable workers, as evidenced by the double screening process of selective admissions into college and then graduation from college (Arrow, 1973; Stiglitz, 1975).

Both screening and signaling theories, as well as human capital theory, promote LMA policies, at least at a broad level, such as policies that encourage more students to complete higher education. While the respective theories differ in the underlying meaning of credentials, i.e. technical skills versus personality disposition, they share the idea that education represents valuable skills or abilities in potential workers related to production at work. These perspectives share the assumption that wage returns to workers with college degrees are a result of employers paying more for their higher productivity. The main shortcoming of these perspectives is that they focus on individual workers and their characteristics and do not examine employers' perspectives to document their reasons for using educational credentials when hiring workers. They do, however, reinforce the idea that employers pay a premium for higher education, which suggests that employers, as well as workers, benefit. It is not difficult to see how policy and education

stakeholders could use any one of these theories to embrace LMA as a means to increase economic prosperity for workers *and* businesses.

However, screening and signaling theories do present some challenges to the concept of LMA. Since they indicate that the qualities of the individual, not the education itself, may be driving the value of credentials, these theories bring into question the long-term effectiveness of policies that increase higher education credential attainment. If the education is simply functioning as a "seal of approval" of inherent qualities, then sending more people to college via policies such as "College for All", may negate the screening and signaling effects over time.

In addition to screening and signaling theories, conflict perspectives also provide a contrast to the human capital perspective. These perspectives generally argue that rather than develop skills and abilities relevant for work in a meritocratic system, the role of education is to perpetuate social inequality and preserve limited resources for the more powerful in society (Bills, 2004; Collins, 1979). Several sociological theories, including control, cultural capital, and credentialist are forms of the conflict perspective, united by their common examination of the role of education in maintaining power relations in society. They vary in the extent to which they also argue that education generates qualities in individuals related to work.

Bowles and Gintis (1976, 2002) argue that educational practices within schools act as a means of control by socializing students, based on their social class, for their future roles as workers in capitalist society. In this view, education teaches lower class students to be compliant and controllable, not to question authority, and to follow instructions; in contrast, it teaches upper class students to develop independent thoughts, cultivate expressiveness, and be independent and self-directed. Rather than provide technical skills, this perspective views education as providing social dispositions and attitudes for class-based roles in the workplace. Similarly, Bourdieu argues that education is a means of conveying knowledge and dispositions in a class-based system where the education system reflects the knowledge and dispositions of the elite (Bourdieu, 1998). The cultural knowledge or "capital" embodied in the educational system is a valued currency in the competition for status and resources. Education is associated with the development of class-based cultural attitudes and dispositions and selection into institutions based on one's status. The ultimate result of education is the certification of these cultural attitudes and dispositions through degrees.

The credentialist perspective provides another similar argument that elite groups use educational credentials to maintain status and advantage by requiring credentials for entry into occupations to prevent other groups from entering and competing for jobs (Brown, 1995; Collins, 1979). Collins takes a historical view on the expansion of education credentials, for example, arguing that the primary force behind credential expansion in the US was conflict among ethnic groups (Collins, 1979). It questions the role of educational credentials in the hiring process and critiques them as being poor markers of skill. Rather, it argues that education teaches middle class culture in terms of physical appearance and communication style and conveys cultural attitudes and dispositions needed for elite occupational positions (Brown, 1995, 2001; Collins, 1979).

Institutional Perspectives on the School-to-Work Transition

Education is a social experience that occurs within the context of social structures in institutions. Literature focused on understanding these structures and institutions provides another perspective on higher education and LMA. The transition from school to work is one of many life course transitions where individuals interact with institutions to transverse social roles—in this case to move from being a student to a worker. This transition is not a linear progression of events, since people often have interruptions in their education or attend school part-time while working or find they need to return to school later in their lives for retraining and career changes. By examining the institutional structures in place within institutions, this research seeks to uncover how aspects of LMA occur within the context of organizations, how these are affected by their context, and how these affect individuals (Rosenbaum & Binder, 1997).

An important aspect of this viewpoint is the recognition of institutions and systems as the mechanisms for moving people from the role of student to the role of worker. These systems are based in the national culture and its views of social mobility, linked to larger stratification structures and beliefs. Compared with other countries (e.g., Germany's apprenticeship, dual model, and Japan's model where teachers provide essential links to jobs), the United States lacks a coherent system to move students from school to work. The US system is very open; linkages are not tight in most cases—credentials are general, there are multiple points of entry, and academic performance is often unexamined in the workplace. Community colleges have been noted for their greater focus on preparation for work and tighter connections with the workforce (Grubb, 1996). In a discussion of school-to-work, Rosenbaum notes that the problem of transition is "hard to conceptualize because it involves many complexities" (p. 264); the same is true of labor market alignment with higher education.

The most significant work that directly addresses the institutional mechanisms of LMA in the context of higher education has focused on community colleges. Deil-Amen & Rosenbaum (2004) examine the role of schools—specifically community colleges—in the transition to work. They discuss how the school facilitates the linkage between students and employment- and how their particular institutional practices serve to support this transition. They examine the different practices across schools in how they prepare students for the workforce. Rosenbaum and colleagues conducted research comparing students in sub-baccalaureate programs at community colleges and private "career colleges" (Deil-Amen & Rosenbaum, 2003; Person & Rosenbaum, 2006). Based on their findings, they conclude that community colleges are organized in a way that requires students to possess the social know-how to navigate the college environment. In contrast, they find that private career colleges have institutional structures that reduce the need for social know-how among students. They identify seven strategies that private career colleges use to structure their institutions so as to facilitate student success. These strategies include eliminating bureaucratic hurdles, reducing confusing choices, providing college-initiated

guidance and minimizing the risk of student error, investing in counselors and eliminating poor advice, quickly detecting costly mistakes, and reducing conflicts with outside demands (Deil-Amen & Rosenbaum, 2003).

The U.S. Department of Education's Community College Labor Market Responsiveness Initiative produced several key reports examining the characteristics of responsive community colleges, the key steps to creating a responsive institution, and some key labor market outcomes related to responsiveness (Harmon & MacAllum, 2003a; Jacobson, Yudd, Feldman, & Petta, 2005; MacAllum, Yoder, & Poliakoff, 2004). The characteristics identified include: a comprehensive strategy for responsiveness across all programs at the college; recognition of the importance of aligning with local labor markets and their rapidly changing nature; attempts to meet the needs of a range of constituents; and development of processes that anticipate labor market needs and implement programs quickly (MacAllum et al., 2004). This initiative proposed the following definition for labor market responsiveness in community colleges: "A labor-market-responsive community college delivers programs and services that align with and seek to anticipate the changing dynamics of the labor market it serves. These programs and services address the educational and workforce development needs of both employers and students as part of the college's overall contribution to the social and economic vitality of its community" (MacAllum et al., 2004).

More recently, Adams, Edmonson, and Slate (2013) developed a "Model of Market Responsive Institutions" that further explores characteristics of labor market-aligned community colleges and the internal and external influences affecting how colleges approach alignment. They describe the internal environment of responsive colleges as "creative, responsive, and anticipatory" (p. 531) with structures that allow for changes based on continual changes in their external environment of the labor market. In this framework, the responsiveness is reflected across all functions of the college and actively promoted by college leadership. Importantly, the framework highlights the importance of having a culture that values data and on-going feedback.

Toward a New Vision for Understanding LMA

In this chapter, we propose a way to view LMA that differs sharply from the current policy perspective. Whereas LMA appears in the policy literature as a straightforward, functional process of connecting education and work structures, we propose that LMA is better viewed as a complex and evolving social process that results from the convergence of multiple stakeholders who have conflicting goals. The key difference in these views is that the former leads to the notion that there are commonly accepted goals for LMA and that there is likely one or more "correct" ways of addressing and measuring those goals, whereas the latter view introduces the idea that LMA is a socially constructed set of goals, activities, and outcomes that is dynamic, fluid, and not subject to precise, universal measurements.

The Functionalist Policy Perspective: LMA as Simple Engineering

The current policy literature positions LMA as a simple, linear process that is not particularly complex in its implementation (Cappelli, 2014; Perna, 2013). There is a tendency in policy circles to propose LMA from a fundamentally functionalist perspective. LMA is presented as a simple, one-size-fits- all "engineering solution" (Cappelli, 2014). A number of policy reports, for example, propose that institutions of higher education simply change their majors and enrollment limits to align the type and number of credentialed graduates with the type and number of available jobs (Carnevale, Smith, & Melton, 2011; Carnevale, Smith, & Strohl, 2013; Sparks & Waits, 2011).

This notion of LMA as engineering suggests that if we can only find the right approach, then higher education and the labor market will neatly align, like fitting pipes together. In fact, much of the policy literature also describes LMA in terms of efforts educational institutions should undertake to build "pipelines" of skilled workers, and "career ladders" or "career pathways" for workers to access jobs (Ferguson, 2013; Richburg-Hayes, Armijo, & Merrill, 2013), which further reinforces the view of LMA as a feat of engineering. While the latter term begins to introduce some complexity, overall these analogies imply that LMA is a straightforward task of building structures that connect education and work. In fact, career pathways are defined as "a clear sequence, or pathway, of education coursework and/or training credentials aligned with employer-validated work readiness standards and competencies" (Kozumpli, Nyborg, Garcia, Cantu, & Larsen, 2011).

According to Ruby (2013), this engineering-based approach to building competencies that align with the skill needs of occupations is likely rooted in the practice of "Task Analysis". This practice emerged from the social efficiency movement of the late 1800s, which was led by Winslow Taylor's doctrine of scientific management. Ruby suggests that the simplicity of this approach is appealing to policymakers who can then "concern themselves solely with outcomes, leaving aside debates about "process," how learning should be organized, and the level of "inputs" necessary for learning to occur" (p. 25). From this perspective, pipelines provide easily measurable unfettered access and movement along an educational pathway that joins education and the labor market.

A New Vision for LMA

As discussed above, the dominant view in the policy literature is a functionalist perspective that defines LMA as an inherently simple act of engineering that should result in uniform results with uniform measurements. Empirically, however, LMA is far from simple in its conceptualization and implementation, resulting in a complex array of LMA goals, outcomes and approaches. This complexity results from

the inherent tension between the goals held by the multiple stakeholders that engage in LMA efforts. We propose that specific labor market alignment goals and approaches result from a dynamic process of balancing complex stakeholder needs, economic conditions, and other factors. Further, as we will explore in more depth later in this chapter, the data on labor market supply and demand that the functionalist approaches rely on to match higher education outputs with demand from the labor market are not reliable enough to build the types of "pipelines" and "ladders" policy stakeholders envision.

By reframing LMA as an evolving social process instead of an act of engineering, we can build more room for the acceptance of a wide range of goals, approaches, and measurements of LMA in the public discourse. Rather than seeking uniformity, we can learn to embrace and foster diversity in LMA approaches. This approach holds the promise of better allowing colleges and universities that have a liberal arts or social equity mission to build LMA approaches that balance multiple institutional goals and accommodate the needs of outside stakeholders.

Two Broad Goals of LMA Efforts

At the broadest level, all LMA efforts touch on at least one of two intertwined, but conceptually distinct, goals: "job vacancy" and "skills alignment". Stakeholders interested in higher education LMA tend to focus on one or both of these two broad goals. Our definition also distills these two broad goals for LMA from the literature—job vacancy alignment and skills alignment. The first goal, which we call *job vacancy alignment*, involves matching the number of graduates from particular programs with the quantitative demand for workers with these credentials. Job vacancy alignment involves "getting the numbers right." It seeks to answer the question: do the number of graduates match with the number of job openings? For example, several reports suggest that higher education should align with the labor market by increasing the number of college graduates, in general, or in specific areas such as science, (Carnevale et al., 2011, 2010; Githens, Sauer, Crawford, Cumberland, & Wilson, 2014; Herschel & Jones, 2005) technology, engineering, and math (STEM), to meet future national demand for workers (Carnevale et al., 2010; Carnevale, Strohl, & Melton, 2011; Cooper, Adam, & O'Leary, 2012; Wilson, 2014).

The second goal, which we call *skills alignment*, involves aligning the skills, competencies, and credentials offered in higher education with those most in demand in the labor market. Skills alignment is a measure of the extent to which the skills and credentials gained in a program match the needs and preferences of employers. It seeks to answer the question: do the skills graduates possess match with the skills sought for related jobs? A number of reports and initiatives define LMA in these terms, urging colleges to ensure that graduates possess the basic workplace skills and /or the technical competencies employers require, either instead of, or in addition to, ensuring that the right numbers of graduates are available ("Aspen Guide for Using Labor Market Data to Improve Student Success," 2014;

Associates, 2013; Boyer, 1998; Cleary & Fichtner, 2007; Colby, Sullivan, Sheppard, & Macatangay, 2008; Council, 2014; G. Splitt, 2003; The Secretary's Commission on Achieving Necessary Skills, 1991). Like job vacancy alignment, skills alignment is complex; the skills employers seek may reflect essential requirements for the job while others may reflect preferences that can shift depending on labor market conditions or the preferences of particular employers (Cappelli, 2014).

As the literature reveals, while some stakeholders focus more on building solutions that help students, jobseekers, or workers and others focus more on issues of business growth or national competitiveness, many stakeholders claim that improved alignment of higher education with employer needs will address one or both of these goals at once.

A Dynamic Balance of Multiple Stakeholders' Needs

Achieving the goals of "job vacancy" and "skills" alignment is not a straightforward task given the complex reality of modern higher education. This reality involves balancing the needs of multiple internal and external constituencies, as well as working to accomplish several missions, all within the context of an ever-changing external environment (Adams et al., 2013; Harmon & MacAllum, 2003b; Keith MacAllum, Karla Yoder, & Poliakoff, 2004). The "correct numbers" and "necessary skills" may mean something different for policymakers, students, and employers. For example, employers may have an interest in producing an over-supply of students with particular credentials required for entry-level employment, while students and policymakers may have an interest in closely matching production to demand and including broader skills to allow for career advancement. Defining goals and activities related to alignment involves taking into account the needs of numerous stakeholders, including students, employers, institutions, and others, while dynamically responding to changing labor market conditions.

Students approach higher education with several distinct needs relative to the labor market. Most students, for example, seek to earn a good wage upon completion of their educational program (Botelho & Pinto, 2004; Godofsky, Zukin, & Van Horn, 2011; LaVelle et al., 2015; Pryor et al., 2012). On the other hand, many students also seek to find majors and careers that match their interests and abilities, which, in turn, may or may not align with labor market needs ((Malgwi, Howe, & Burnaby, 2005; Pritchard, Potter, & Saccucci, 2004). However, different types of students also have distinct needs based on their relationship to the labor market. Adult students are more likely than younger students to be interested in education that is more work-relevant (Kasworm, 1990; Knowles, Holton, & Swanson, 2012). Students' needs vary depending on whether they are entering the labor market for the first time, changing their career, seeking to advance within their existing career, and/or combining work and learning. Thus, they vary in the extent to which they seek immediate preparation for the workforce and are prepared to make and follow through on a career decision.

Employers also have distinct needs that reflect their preferences. From a job vacancy perspective, employers may seek to have skilled graduates to fill their open positions. With regard to skills alignment, employers increasingly seek to hire graduates who are ready to work immediately. The concern about preparation for immediate work may entail a narrower education pathway that limits flexibility for students and conflicts with the goal of providing a broad-based education (Cappelli, 2014; Jacobs & Grubb, 2003). Further complicating the issue, not all employers share the same needs, which depend on a variety of factors, including size, sector, and industry, as well as whether the labor market is tight or slack (Cappelli, 2014).

Higher education institutions must balance LMA efforts with other missions and priorities at the system, institutional, and program levels. A key goal of higher education has traditionally been general and civic education, and mission statements vary significantly across institutions. While there is some emerging support for an approach that blends broad-based education with more specific technical skills education, many higher education stakeholders, especially those in the liberal arts, may still view too much specific technical skills education as having the potential to marginalize other goals, including general and civic education (Gallup, 2014; Myers, 2012). In addition, higher education institutions are also concerned about their own financial survival, as they have increasingly been under pressure to generate tuition income as public funding decreases (Desrochers & Hurlburt, 2014).

Other external stakeholders have interest in supporting various LMA goals of these primary stakeholders, though they have a less direct interest in it. National, state, and local policymakers, accreditation bodies, and public and private funders often seek to promote particular approaches to LMA that align more closely with the needs of one or more of the primary stakeholders noted above. They may also promote LMA for political reasons such as demonstrating their responsiveness to business (Dougherty & Bakia, 2000). Recent performance funding initiatives in some states tie student employment to institutional funding in an effort to promote alignment (e.g., Dougherty & Reddy, 2011; Dougherty & Reddy, 2013; Kelderman, 2013). Parents, alumni, and donors may also have an interest in promoting particular LMA approaches.

Aggregate labor markets and other dynamic factors provide an important basis for understanding LMA. The characteristics of the global and national economies, as well as regional, state, and local labor market dynamics provide factors for consideration with regard to LMA (Adams et al., 2013; Bosworth, Rogers, Broun, & Zeidenburg, 1997; Harmon & MacAllum, 2003b; MacAllum et al., 2004). Colleges pursuing LMA must consider factors ranging from demographic changes in the workforce to the geographic boundaries of targeted labor markets, which may range from local to international, as well as the degree of economic certainty in target industries given the time horizon for degree completion (Fernandez M & Celina, 2004; Froeschle, 2010). Fast-changing economic conditions and labor markets with new and emerging industries, as well as transitional economies, will require different

approaches to address the uncertainties of these labor markets compared to more stable labor markets. The long time horizon of many academic programs raises the question of whether it is possible to predict demand in a complex, ever-changing global economy.

Toward a New Definition of LMA and a New Role for Postsecondary Education

Based on our review of the literature, we define labor market alignment (LMA) as: All activities—and related outcomes—with the goal of ensuring that higher education institutions graduate the *correct* number of graduates with the *necessary* skills for the job market in a way that supports students' career goals and is consistent with institutional mission, current economic conditions, and the needs of other involved stakeholders.

This definition is broader and more flexible than previous definitions of LMA. It can be applied to different types of institutions and to different levels of implementation. Overall, it is a definition that allows for the presence of competing interests and the resulting development of many different LMA goals and approaches. To do this, our definition encompasses normative ideas about LMA goals. No standards currently define how to assess and achieve the "correct" number of graduates and the "necessary" skills for the job market (Froeschle, 2010), and there is little evidence regarding which approaches work optimally for different stakeholder groups and levels of implementation (Harmon & MacAllum, 2003a).

As a result of using this all-encompassing and norm-neutral definition, LMA can be operationalized in numerous ways depending on the institutional context and program type—from traditional vocational education programs at community colleges, to efforts to reform career services and academic advising at liberal arts colleges and universities, to graduate-level professional education, competency-based education and career pathways initiatives that seek to connect multiple levels of postsecondary education. In the following section, we provide a framework for conceptualizing the diversity of these approaches.

Whereas the current policy literature imposes an array of conflicting solutions on higher education, conceptualizing the LMA process as a social process puts more power in the hands of higher education officials to develop goals and solutions from the ground up, rather than simply defending against calls for change from the outside.

Understanding Existing Alignment Approaches in Higher Education

All areas of higher education, including curricular and co-curricular, can support alignment goals. Multiple areas within higher education can have a role in supporting alignment. Table 12.1 summarizes typical areas—both curricular and

Table 12.1 Higher education areas for alignment, by goal

	Job vacancy alignment	Skills alignment
Curricular		
Program selection and enrollment management	√	
Program content and curriculum development		√
Instructional strategies		√
Co-curricular		
Work-based learning activities		√
Student advisement and support services	√	√

co-curricular—within higher education and whether each area is likely to support job vacancy alignment and /or skills alignment goals. In curricular areas, higher education actors can pursue alignment through program selection and enrollment management, program content and curriculum development, and instructional strategies. In addition to curricular areas, higher education actors may consider how co-curricular activities support alignment goals, including work-based learning activities as well as student advising and support services.

Alignment Approaches by Goal

Program Selection and Enrollment Management

Selecting programs and determining their levels of enrollment based on what is known about labor demand is most directly related to job vacancy alignment. At a minimum, these efforts seek to ensure that the programs offered lead to jobs in demand among employers in the target labor market. Colleges and college systems may also manage enrollment within programs so that the number of graduates matches the job openings for workers in these occupations to ensure that there is not a severe under- or over-supply of graduates with particular credentials ("Aspen Guide for Using Labor Market Data to Improve Student Success," 2014; Sparks & Waits, 2011; Turner, 2002a; Wilson, 2014). However, the adjustment of degree production based on job openings may take on a different priority depending on the strength of the linkage between the credential and particular occupations, which varies considerably.

Program Content and Curriculum Development

Higher education officials commonly tend to view skills alignment as adjusting program and curriculum content based on labor market needs. This raises a central tension of LMA in balancing the needs of stakeholders in determining labor markets and employers with which to align and whether to pursue a broad or tight approach

to skills alignment. Higher education systems, institutions, and programs vary significantly in how tightly they seek to align their curricular content with the immediate, or technical, or anticipated future needs of employers versus maintaining broader content that supports students' long-term learning goals and overall flexibility in the labor market (Jacobs & Grubb, 2006). For many institutions, general learning outcomes as part of a liberal education are a core goal that may also meet broad employer needs (Association of American Colleges and Universities, 2008; Pellegrino & Hilton, 2014).

Instructional Strategies

Once program content is defined, how institutions convey that content to students is an essential step in achieving alignment. A growing set of initiatives and literature on teaching strategies supports the notion that active and applied learning as well as problem-based learning are effective ways to engage students in deeper learning (Fain, 2013; M. Freeman, deMarrais, Preissle, Roulston, & St. Pierre, 2007; Hewlett Foundation, 2014; Prince, 2004). Reform efforts such as competency-based education, contextualized learning, and accelerated learning models may provide promising approaches to deliver instruction that promotes work readiness (e.g., Cho, Kopko, Jenkins, & Jaggars, 2012; Klein-Collins, 2012, 2013; Perin, 2011).

Work-Based Learning

Work-based learning opportunities have long been viewed as a way to gain learning experience that develops skills relevant in the labor market. They include a range of activities, including internships, co-operative education, apprenticeships, job shadowing, practicums, clinical rotations, on-the-job training, school-based enterprises, business simulations, guest speakers, student competitions, career academies, career days, and school-to-apprentice programs (Alfeld, Charner, Johnson, & Watts, 2013; Bragg & Hamm, 1995; Bragg, Hamm, & Trinkle, 1995; Congress of the United States, 1995; Stasz & Brewer, 1998). Likewise, activities that engage students in real-world projects such as service learning and civic education can provide analogous learning opportunities.

Student Advisement and Support Services

Higher education systems, institutions, and programs can promote LMA through student advising and support services. Most higher education institutions have career services offices that help guide students but some institutions are considering ways to improve these services by re-thinking how they interact with other higher education structures (Chan & Derry, 2013). At the simplest level, institutions and programs provide students with information about labor market demand as part of

traditional career advisement sessions. Alignment activities in this area can also take the form of blending academic and career advising in new ways or they can broaden the reach of career services by having more advising take place at the department level. A number of higher education systems and institutions are also focusing on ways to reach students earlier for career and academic advising, including conducting outreach to high school students and parents, creating for-credit career courses for all first- or second-year students, and sometimes mandatory career development activities for students (Chan & Derry, 2013; Dominus, 2013).

There is no "one-size-fits-all approach." LMA approaches across these areas vary on a couple of key dimensions. First, LMA approaches vary in how they conceive of the labor market including the geographic boundaries of target labor market(s) (i.e. international, national, regional, state, local); the scope and specificity of targeted industries/jobs (i.e. specific job title, occupation group, all jobs in an industry, etc.); and the scope of targeted employers (one employer vs. multiple employers, diversity of composition of employers). Second, LMA approaches vary in the degree of response to the labor market in terms of the "tightness" of program approaches—that is, how closely programs and services are matched to the skill and job vacancy priorities of employers. For example, some institutions, especially those with a liberal arts mission that are less likely to change curricula and instructional strategies that closely align with employer needs, but rather may rely heavily, even exclusively, on co-curricular activities to achieve their alignment goals. Table 12.2 illustrates a range of possible LMA approaches at different organizational levels with varying approaches based on these dimensions.

Some leading higher education organizations are developing approaches to address the issue of LMA. For example, the American Association of Colleges and Universities' Liberal Education and America's Promise initiative is seeking to develop strategies and better articulate ways that liberal education prepares students for the rigors of the twenty first century economy.

Challenges of Alignment

Many Levels of Implementation

While prior alignment frameworks have focused on the institution as the unit for alignment, we recognize that alignment can occur on many levels—from the very macro to the very micro. Thus, the concepts in this framework are intended to apply to these different institution levels including: the system level, including groups of institutions, such as a specific higher education sector or all institutions within a state or a region; an institution, such as a single college or university; a department, including several related programs in an institution; a program of study within an institution; and a class within a program of study within an institution. LMA may be carried out in these various levels simultaneously as actors within each level take

Table 12.2 Examples of LMA approaches

Career pathways system reform at the state level	4-year liberal arts college	University academic department	Community college workforce program	Short-term professional development course
State labor market assessment to determine programs to expand and/or add	Local, regional or national labor market assessment to inform new majors and broad enrollment levels	National or state labor market assessment to determine majors to expand and/or add	State or local labor market assessment to determine specific programs and enrollment levels	Local labor market assessment to determine specific enrollment levels
Employers provide input on occupations, credentials, and broad skills	Employers provide broad input on general skill needs	Employer advisory groups provide high-level input on skill needs and competencies	Employer panels to identify specific skills and competencies for curriculum	Employer panels to identify specific skills for curriculum
Contextualized learning	Problem-based learning and intensive writing	Problem-based learning	Hands-on applied learning	Problem-based learning
Connections to workplace learning fostered	Internships and industry exposure strongly promoted	Internships required strongly promoted	Required internships	Job shadowing experience for all
Stackable credentials	Coordinated academic and career counseling, early and on-going.	Integrated academic and career counseling, mandatory	Coordinated academic and career counseling, early and on-going.	Integrated career advising
Prior learning credit for work and military experience	Optional career course for credit	Mandatory for credit career development course		

action to align educational programs and services with the job vacancy and skill needs of employers. Figure 12.1 illustrates these possible levels of alignment.

Furthermore, this framework is intended to apply to a range of institutional types, including two- and four-year institutions. While these institutions vary in their missions and corresponding mix of programs, the general principles of LMA apply to both. Namely, there are examples of each institutional type taking action and pursuing outcomes related to job vacancy and skills alignment goals. It may also apply to continuing education efforts within these institutions.

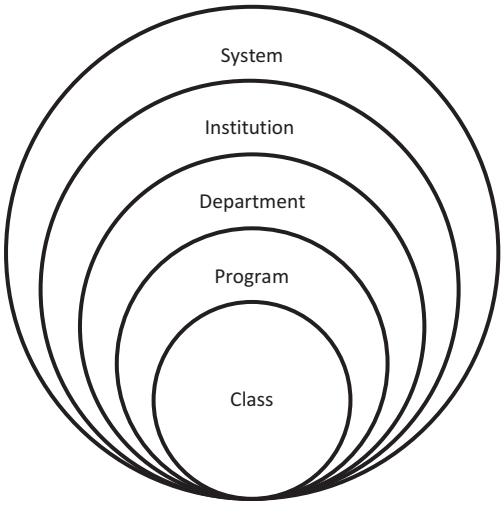

Fig. 12.1 Institutional levels for labor market alignment

Little Research on What Works for Whom

Just as we do not know which LMA approaches work best for particular stakeholders, no research is available on which approaches work best for certain groups at different institutional types or levels of implementation. As partnerships develop across levels and institutions, it is also possible that the needs of different groups may further conflict. For example, aligning higher education with the labor market based on statewide labor market information may disadvantage local areas that have different employer demand and worker supply profiles.

LMA as Organizational Learning

The earlier discussion of perspectives on LMA address LMA as a solution and highlight the embedded assumptions about the role and value of education in relation to workforce development. They also highlight the importance of framing LMA as an essentially social process. However they fail to help us conceptually and practically understand how to do LMA. In other words, they have little to do with process. And since they do not address process, they cannot help us deal with such practical issues as how to measure alignment. It is in light of this absence of process that we turn to organizational learning and suggest that it can help higher education leaders, in particular, to reconceptualize LMA as an important strategy for improving student success within postsecondary education and beyond. We draw upon prior research that suggests organizational learning is useful for understanding the theory of action undergirding many educational change and student success efforts. We present two main perspectives of organizational learning, background on what

organizational learning is, and how activities that we have identified as alignment activities can be viewed as organizational learning functions and the benefits of doing so.

Although there are myriad frameworks to integrate the disparate organizational learning and organizational knowledge literatures (Chiva & Alegre, 2005; Fiol & Lyles, 1985; Huber, 1991; Kezar, 2005; Lam, 2000; Örtenblad & Koris, 2014; Popova-Nowak & Cseh, 2015), we begin by drawing upon some of the most recent literature on organizational learning in public services to supplement the scant literature in postsecondary education. We draw specifically on applications of organizational learning in public services because, like higher education, it is particularly susceptible to pressures for learning and innovation because of the accountability expectations of myriad stakeholders and both are characterized by the existence of professional communities that span organizations and are under constant pressures for reform (LaPalombara, 2007; Rashman, Withers, & Hartley, 2009).

Higher education researchers (Jones et al., 2015; Kezar, 2005) agree that organizational learning is useful for understanding the theory of action supporting many change efforts in postsecondary education, although the application of that literature empirically is scant (Dee & Leisyte, 2016; Örtenblad & Koris, 2014). As Jones et al. (2015) explain, understanding the capacity to analyze institutional performance, identify deficiencies, and craft and evaluate solutions is fundamentally about the institutional capacity for organizational learning. By doing so, many have framed organizational learning as an approach to solving problems within higher education, for example, to support organizational change to promote and value diversity (Smith & Parker, 2005) and to achieve equity in educational outcomes (Bauman, 2005). We offer one more area that organizational learning can support: labor market alignment.

An organizational learning framework is well suited to the postsecondary context (Bensimon, Polkinghorne, Bauman, & Vallejo, 2004; Boyce, 2003; Eckel, Green, & Hill, 2001; Smith & Parker, 2005). Colleges and universities are generally viewed as collegial institutions that are highly decentralized, with a professional staff that is interested in learning and improvement. More so than other sectors, the application of organizational learning to higher education is replete with references to organizational learning as a process to improve effectiveness rather than a product to accumulate (Smith & Parker, 2005; Kezar, 2005). Kezar suggests that "higher education may be at an advantage compared to other organizations since fields such as student affairs have tended to favor and foster social and emotional intelligence" (p. 54) and already conducts much of its work in groups and teams, which are well suited to facilitate organizational learning. However, alignment is not just about individual postsecondary institutions; exploring a shared value of organizational learning across postsecondary sectors and across the labor market is challenging and faces much resistance. Choosing to undertake LMA requires attention to resistance that may exist as a result of the previously discussed drivers of LMA.

Two Perspectives on Organizational Learning

We draw upon a number of organizational learning frameworks, paying particular attention to those that distinguish between organizational learning as something to be possessed versus a process. The first perspective on organizational learning, the cognitive-possession perspective, emphasizes the individual (Chiva & Alegre, 2005; Örtenblad & Koris, 2014) and includes cognitive, social, behavioral, and technical components (Rashman et al., 2009). Within this perspective some scholars focus on the role of the individual and individual learning processes to the organization (Friedman, 2001) while others (Argyris & Schon, 1996; March & Olsen, 1975; Simon, 1991) suggest organizational learning is individual learning that is situated within and in interaction with an organizational context. As a possession, such a perspective is congruent with the view that knowledge is a commodity to be gained. Implications of this view include a concern that organizational learning is then a question of how knowledge may be accumulated, stored, and transmitted as needed.

In the alternative perspective, the social-process perspective, learning is not about accumulating knowledge. Borrowing from social learning theory (Lave & Wenger, 1991; Wenger, 1998), learning is a social process of identity development within a community of practice. The social perspective treats learning as inseparable from social interaction and engagement in work practice. Rather than framing organizational learning as a competitive exercise that provides one firm with an advantage over the others in the market resulting from the accumulation of information and resources (Blackler, 1995), organizational learning becomes a social process that individuals engage in through social interaction within an organizational context that is a function of their identity and identity development in that context (Chiva & Alegre, 2005; Gherardi, Nicolini, & Odella, 1998; Rashman et al., 2009).

Integration of Perspectives and Application to LMA

In sum, organizational learning is a dynamic, social, and contextual process that involves sharing and assimilating existing knowledge and creating new knowledge, both of which may be influenced by organizational and environmental cultures, practices, norms, and routines. We see value for understanding LMA in both the cognitive-possession and social-process perspectives. The cognitive-possession perspective is immediately evident in the current literature that applies organizational learning to postsecondary education contexts in which tools are identified, structures created, strategies developed for increasing capital (Borden & Kezar, 2012; Choi & Chandler, 2015; Kezar, 2005). These offer concrete suggestions for tasks and structures that can be leveraged in the process of LMA. However, the social-process perspective is also needed to make sense of the multiple actors and fluid goals inherent in our proposed definition of LMA.

A perspective that recognizes that institutions are socially constructed in communities is useful to our LMA framework that grapples with vastly different organizational types within the education sector and that recognizes the ways in which these educational organizations must interact with other organizations and government agencies. The acknowledgment of the context, i.e., "relationships with other organizations through alliances, joint ventures, and memberships in associations" (Argote, 2013, p. 33), in which organizations exist and organizational learning occurs is particularly important. The idea of relationships with other organizations is particularly relevant for this chapter given the professional communities that span organizational boundaries (Rashman et al., 2009) in the context of labor market alignment with postsecondary education.

Organizational Learning Mechanisms

Across both perspectives, Lipshitz and colleagues' (Friedman, Lipshitz, & Overmeer, 2001; Lipshitz, Friedman, & Popper, 2007; Popper & Lipshitz, 2000) construct of organizational learning mechanisms (OLMs), provides a useful tool to both identify existing organizational learning activities and to create new structures in support of organizational learning. They define OLMs as "institutionalized structural and procedural arrangements that allow organizations to systematically collect, analyze, store, disseminate, and use information that is relevant to the effectiveness of the organizations" (p. 170). Furthermore, OLMs also aid in efforts to measuring organizational learning. We present examples of OLMs that support LMA grouped into three broad alignment activities: data collection, data incorporation, and relationship building. Each of these concepts is explained in more detail below. Others have addressed the role of data collection and analysis in discussions of labor market responsiveness by emphasizing a culture of inquiry and evidence (Adams et al., 2013), but our framing with a broader theory of organizational learning extends beyond the focus on data, analysis, and decisions to the collaboration and learning across different curricular areas and organizations and the importance of relationship building. After discussing available labor market specific data in the context of data collection, we then explore data incorporation and relationship building, which are more appropriately explored through a learning framework than a decision making framework.

Data Collection

Of all the activities, data collection is the most extensively addressed activity in the organizational learning literature, therefore we focus here on the labor market specific data. Collecting information on the skill and job vacancy needs of employers in the target labor market, as well as on the needs of students and other critical stakeholders, is an essential LMA activity but little is known about how to best

collect and use these data. We explore the varieties of relevant data that exist and the challenges of gathering and using them. In order to align programs and services with labor market demand, systems, institutions, and programs engage in a variety of activities to collect and or validate information on these needs. Much of this data collection, however, is focused on assessing job vacancy and skill demand in target labor markets. Despite its importance, little agreement exists in the literature regarding the best data sources and indicators to use (Barghaus et al., 2013; O'Connor, 2013). As a result, stakeholders implementing alignment activities use a variety of public and private data on labor market demand and supply, as well as focus groups and other forms of qualitative input from employers. Multiple types of data are available for these efforts, including those that are publically available, those that must be purchased, and those that must be collected. Each data collection/validation method has unique opportunities and challenges.

Publicly available data includes data produced by the U.S. Department of Labor Bureau of Labor Statistics, labor market trends data from state departments of labor, and data on graduation rates from state departments of education (Sparks & Waits, 2011; Wilson, 2014). The Occupational Outlook Handbook and O*Net, both produced by the Bureau of Labor Statistics, provide information on skills and credentials required in specific occupations that some alignment stakeholders may use to collect information on skill demand. Traditional labor market data produced by the Bureau of Labor Statistics and states have been faulted for not producing employment trend data that are current enough to assess job vacancy demand, for being of limited use and accessibility to practitioners, or for including job growth projections that often end up being false (Cappelli, 2014; Froeschle, 2010; Van Horn & Corre, 2010). Froeschle has also pointed out that publicly available data, including data on recent graduates, are not sufficient to assess skilled labor supply in an area.

Several companies offer a new source of demand, as well as skills data, known as "real-time jobs data" that are available for purchase. Online job postings are collected, aggregated, de-duplicated, and analyzed to provide a more up-to-the-minute picture of hiring trends and skill requirements for local areas not previously available. A number of community colleges have reported using "real-time jobs data" to align their workforce programs (Altstadt, 2011). Real-time jobs data, while more current than traditional labor market information, relies on proprietary systems to collect and analyze unstructured data. As a result, the data validity and reliability in terms of representativeness of real-time labor market information is not well known (Dorrer & Milfort, 2012).

Employer surveys and direct engagement with employers are other ways to collect information on job vacancy and skill demand in target labor markets. State- and region-wide surveys of employers are a common way to collect labor market information (e.g., Workforce Training and Education Coordination Board, 2013). Direct engagement with employers can range in approach. The Systematic Curriculum and Instructional Development (SCID) and Developing a Curriculum (DACUM) methods provide a structured, in-depth, way to identify and/or validate specific skills and knowledge needed for particular occupations (Ohio State University, 2014). On the other hand, many institutions rely on one-time advisory groups, or other methods

that provide broad feedback but do not generate detailed knowledge (Harmon & McAllum, 2003). Little is known about the effectiveness of various approaches to advisory board and employer outreach, and how this type of feedback can be obtained for programs with more general learning outcomes. Many obstacles also exist for higher education institutions interested in surveying or otherwise engaging with employers, including a lack of capacity or interest among faculty/staff or difficulties getting employers to respond to requests for engagement (Barnow & Spaulding, 2015; Hershbein & Hollenbeck, 2014).

There are no current standards that indicate which data indicators and sources provide the most reliable and valid information for colleges on job vacancy and skill demand. Given the uncertainties of labor market data and the difficulties of employer engagement, multiple data sources may provide the best mechanism to assess demand and supply, and inform program selection and enrollment management ("Aspen Guide for Using Labor Market Data to Improve Student Success," 2014; Bosworth et al., 1997).

Incorporation Into Curricular and Co-curricular Areas The application of knowledge is a core activity in organizational learning; without a process for applying the collected data, there is no possibility of improved effectiveness (Lipshitz et al., 2007). Incorporating the results of data collection into curricular and co-curricular areas and connecting and re-organizing the delivery of multiple program components is common in colleges and universities, but doing so in a way that leads to organizational change and learning is a challenge. Regardless of the institutional level in which alignment occurs, multiple areas within higher education can have a role in supporting alignment. Table 12.1 summarizes typical areas—both curricular and co-curricular—within higher education and whether each area is likely to support job vacancy alignment and /or skills alignment goals. In curricular areas, higher education actors can pursue alignment through program selection and enrollment management, program content and curriculum development, and instructional strategies. In addition to curricular areas, higher education actors may consider how co-curricular activities support alignment goals, including work-based learning activities as well as student advising and support services. Table 12.2 illustrates a range of possible LMA approaches at different organizational levels with varying approaches based on these dimensions.

Incorporating information into curricular programs is a large and complex area of LMA, as stakeholders can vary widely in the areas they seek to focus their LMA activities. Furthermore, incorporating information varies depending on the institutional level that is the focus of LMA activity–class, program, department, institution, or system. We discuss five possible areas of incorporation in this section: (a) program selection and enrollment management; (b) program content and curriculum development; (c) instructional strategies; (d) work-based learning; and (e) student advisement and support services. Each of these areas offer opportunities to implement OLMs to support the dissemination of information into learning and decision experiences.

Program Selection and Enrollment Management Colleges have processes for adding new programs, eliminating existing programs, and adjusting the enrollment levels. Four-year institutions in some states have begun adding and subtracting programs and adjusting enrollments based on statewide labor market data (Sparks & Waits, 2011). In program reviews, community colleges may document labor market demand for their graduates to justify program renewal. Some college systems also have processes for program approval that involve documenting labor market need. The process for considering how to adjust the selection and enrollment is less clear for programs that are not directly linked to a specific job, including many programs at four-year colleges, particularly those with a liberal arts focus.

Program Content and Curriculum Development Efforts to articulate learning outcomes, such as the Degree Qualifications Framework (DQP), provide a framework to guide institutions in designing programs using agreed-upon general competencies about what students should know and be able to do upon completing a college credential (Adelman et al., 2011). By articulating learning outcomes and developing processes to measure them, these efforts provide an opportunity to consider how these outcomes align with employer needs (Kuh & Ikenberry, 2009). Furthermore the DQP includes a category for program-specific skills which may allow for more specific alignment with labor market needs. Institutions that seek a tight LMA approach may use processes, such as SCID, to incorporate employer skill priorities directly into curricula and assessments (Ohio State University, 2014). Depending on the field, professional organizations and state agencies may provide important structure to guide curriculum alignment activities (Lattuca & Stark, 2009).

Instructional Strategies Data and information collected on student learning needs and employer skill needs can inform how instructional strategies are deployed for job vacancy and skills alignment purposes. Based on program content and curricular development efforts, certain instructional strategies may be more or less relevant. For example, contextualized learning may be most relevant in a tightly aligned workforce program, such as the I-BEST program in Washington State, which prepares low-skilled workers for entry-level career pathways jobs (Wachen, Jenkins, & Van Noy, 2011). Problem-based learning is potentially helpful for students to develop skills and knowledge in a range of disciplines (Dochy, Segers, Bossche, & Gijbels, 2003).

Work-Based Learning Depending on how institutions seek to align with the labor market, different types of work-based learning may be more or less relevant. In particular, the level of intensity of the work-based learning strategy will vary. Many institutions do not have resources to support active work-based learning programs, so creative solutions to this challenge are likely needed to promote employer engagement (Leahey & Chisholm, 2014). The incorporation of work-based learning activities is closely linked to employer engagement efforts and related relationship building activities, discussed further below.

Student Advisement and Support Services Many efforts are underway to convey labor market information to students and help guide their decisions to enter programs and transition into careers. New online e-advising programs at some institutions begin to integrate career and academic advising, though it is not clear to what extent they help students understand and evaluate labor market information (Herndon, 2012). How institutions can best convey this information and how students will use it is still not well understood though evidence is beginning to emerge (e.g., Ruder & Van Noy, 2014). Furthermore, the degree to which online advising systems need to be combined with conventional advising and support is not well known (Karp, 2011; Karp, O'Gara, & Hughes, 2008).

Relationship Management

Relationship building with employers and other stakeholders helps support LMA but little is known about effective ways to engage with employers and keep them involved. The process perspective on organizational learning provides insights on relationship building in support of LMA. OLMs that bring people together facilitate the social interaction that is necessary for learning, contribute to relationship building and the development of social capital. Relationship building, especially with employers, is an important component of higher education LMA (Brewer & Gray, 1997; de Castro & Mechur Karp, 2009; Harmon & MacAllum, 2003a). Employers are more likely to hire workers from a trusted intermediary, and relationships can help college staff to gain access to the information and assistance needed to collect information and incorporate it into curricular and co-curricular areas. Relationship building can be both a by-product of other alignment activities and a standalone activity. For example, relationships with employers can be built organically if a college is using intensive employer contact to collect data on skill and workforce needs. On the other hand, programs that rely on secondary data sources for data collection and that have limited engagement with employers may need to invest more time and effort into building relationships as an additional activity.

Those implementing alignment may also engage in relationship-building activities with other internal and external stakeholders to strengthen connections among program components, such as building in new types of meetings for staff from different areas to interact, or creating activities for staff, faculty, and students to interact. Alignment may also involve multiple partnerships beyond the institution that may include employers. All of these suggestions emphasize LMA as a process that emphasizes the co-constructed goals that higher education and its partners have for student success and the labor market. Relationship building supports the inherently dynamic nature of the labor market and enables stakeholders to deal with change. Finally, relationship building, as a strategy, is not inherent to one organizational level; it is an approach that can be used at the classroom, program, department, organization, and even sector level.

Measuring LMA Efforts

To understand whether higher education institution alignment efforts are making a difference in the success students achieve after college –as well as meeting the needs of employers and local economies—outcome measures are essential. Given the multiple goals and activities related to LMA, identifying clear measures of alignment outcomes is complex. As we have already discussed, there is little agreement on how to define LMA and thus there remain questions about the outcomes that appropriately measure alignment. Despite the complexity in measurement, rather than simply pose more questions that should be answered (Barghaus, Bradlow, McMaken, & Rikoon, 2013; Perna, 2013), we propose preliminary approaches to measurement in an effort to, as Bargaus et al. suggest, help the field decide what may fit best in a given set of circumstances.

In this section, we review existing approaches to measuring LMA outcomes and provide guidance on how to understand these and think about novel approaches to evaluation. Several measures of job vacancy and skills alignment exist, but each has important limitations. Multiple measures of LMA outcome are possible and are currently in use amongst policymakers, funders, and researchers. As suggested by Perna (2013) and others, we explore a range of outcomes and move beyond economic outcomes such as earnings, which are well addressed elsewhere (see D'Amico, 2016 for a summary). We present five measures of alignment outcomes and the alignment goal each most closely reflects: (1) Graduate production compared to job openings; (2) Attainment of credential with labor market value; (3) Graduate earnings, employment, and retention rates; (4) Direct assessment of student/employer perceptions; and (5) Real-time jobs data on turnover. These measures all already exist in one form or another and are focuses primarily at the system and institutional levels of implementation. We then suggest a new consideration rooted in an understanding of LMA as an organizational learning process. Additional measures are also needed at lower levels of measurement such as the class, program, and department levels.

Existing Measures

Graduate Production Compared to Job Opening

Similar to O'Connor's (2013) framework for assessing work-based learning initiatives, we begin with a measure of graduation rates. Graduate production compared to job openings provides a broad measure of job vacancy alignment for geographic regions but suffers from methodological problems. A number of studies compare graduation production from credential-based programs (number of graduates) to the number of jobs created or expected to be created to measure the extent of job vacancy alignment in a labor market (Froeschle, 2010) . These studies have

generally been performed at the higher education systems level in several states (e.g., Leigh & Gill, 2007), cities and regions (Stern, 2013; Workforce Training and Education Coordination Board, 2013) and even at the national level (Bardhan, Hicks, & Jaffee, 2011; Carnevale et al., 2013). In addition to providing a performance metric for LMA efforts, this method appears to be used quite often to get a baseline reading on the level of alignment between supply (recent graduates) and demand (job openings) in a labor market in order to inform or advocate for the development of LMA efforts.

There are many weaknesses inherent to this method of determining alignment, which often uses a nationally developed crosswalk of Classification of Instructional Programs (CIP) and Standard Occupational Classifications (SOC) to match graduates to occupations. First, this method assumes that the relationship between credentials and jobs is strong and that recent graduates from the college system being studied make up the only supply of workers, but connections between college majors and content-related jobs are often not direct, especially in the liberal arts. As Froeschle (2010) notes, there are also many other sources of labor supply for which no data are available (past graduates, incumbent in-state workers, in-flows of out-of-state workers) that are not accounted for in this method. In addition, this approach can be too simplistic in that it specifies a causal link between the programs and outcomes. That is, it is not possible to know that a program, institution, or system is truly responding to a labor market need just from seeing a category match in the data; many other factors are at work in the labor market that are not accounted for in this approach, such as changes in demand, that may affect this match.

Attainment of Credential with Labor Market Value

Attainment of credential with labor market value provides an indication of skills alignment at numerous levels but validation of credentials is not universal. Generating credentials with value in the labor market is the stated goal of many current LMA reform efforts. Often, the increase in production of "employer-recognized" credentials is used to measure the level of skills alignment within LMA efforts. But what does "employer recognized" mean? How do we know if the credential has real value in the labor market? Validation of the labor market value of credentials may be approached in several ways. Credentials can be validated by industry in the form of industry certifications where employer standards are adopted by industry associations at a national level (e.g., The Manufacturing & University of Phoenix, 2011). Licensure is also another means to validate learning based on industry standards. Professional accreditation boards certify some college programs and ensure that curricula adhere to industry standards (Crawford & Sheets, 2015). A major challenge in using the number of credentials attained as a measure of skills attainment is that the mechanisms to validate credentials are not well established; many credentials exist without any labor market validation (Crawford & Sheets, 2015). Furthermore, employers' actual use of credentials in hiring can vary by organization and labor market (Cappelli, 2014; Van Noy & Jacobs, 2012).

Graduate Earnings, Employment, and Retention Rates

Graduate earnings, employment, and retention rates provide a general indication of job vacancy and skills alignment at many levels but are not widely available. The economics literature has had a long history of examining the wage returns to higher education based on human capital theory and O'Connor includes earning power upon college completion as one of her five domains. Many researchers use student employment outcomes data—including job placement, retention, and earnings—to provide an indication of LMA in higher education (Carnevale, Rose, & Cheah, 2011; Jacobson & Mohker, 2009; Jepson, Trotske, & Coomes, 2009; Schneider, 2013; Schneider & Vivari, 2012). Initial placement and wages can indicate both job vacancy and, to a lesser degree, skills alignment. If graduates earn more after completing postsecondary education, then human capital theory infers that students have had the requisite skills (skills alignment) needed by employers (Becker, 1993). Current accountability initiatives, such as the Obama scorecard, use wage data as a measure of graduates' employment outcomes, while US Department of Labor's community college initiatives requires the collection of job placement, retention, and earnings indicators.

There are several benefits and challenges to this commonly used outcomes measurement approach. One of the key advantages is that it provides evidence of change for both students and employers. These indicators can also be applied at the systems, institution, and program levels. However, this approach uses placement and wages as a proxy for both job vacancy and skills alignment, and may not fully represent the motivations underlying student and employer behavior. In addition, these outcomes indicators do not, in and of themselves, allow researchers to determine whether LMA efforts caused the changes. These outcomes represent high-level indicators based on employer behavior, but it is difficult to parse out the degree of job vacancy alignment or the specific ways that skills alignment has occurred or could be improved. Few studies attempt the experimental or quasi-experimental methods needed to do this. To the extent that data on student outcomes may be valuable for LMA planning and advising students, jobseekers and others, another drawback is that these data are not always available in all states or to all institutions and programs in states.

Direct Assessment of Student/Employer Perceptions

Direct assessment of student/employer perceptions provide specific information on job vacancy and skills alignment but are time consuming to collect. Fewer studies directly attempt to measure the extent to which a given program or set of programs aligns with the skill expectations or needs of employers or other stakeholders. Employer or participant satisfaction would be a direct measure of skills alignment; O'Connor suggests student satisfaction is one of five domains in her framework for assessing work-based learning initiatives. To the extent that skills alignment is measured as an outcome, it is often done through surveys of students and or employers

regarding the quality of preparation. Several researchers document mismatches between the skills taught in particular programs and the skills employers require for jobs closely associated with the credential (Alssid, 2014; Colby et al., 2008; Sullivan, Colby, Wegner, Bond, & Lee S, 2007). Others have raised concerns about the validity of perceptions (Soares & Perna, 2014); or variation in perceptions (Van Noy & Jacobs, 2012). Research on skills matching in the labor market addresses the question of whether workers, including college graduates, have skills that are needed in the labor market. This literature raises numerous questions about how skill matching can be properly assessed to determine if worker skills match actual job requirements, and raises many serious methodological concerns that need further research to overcome (Handel, n.d.).

Real-Time Jobs Data on Turnover

Real-time jobs data on turnover provides a new possibility for assessing job vacancy and skills alignment but more information is needed on its use. Data from job postings, also known as "real-time jobs data" offer some additional approaches to measure both job vacancy and skills alignment. Some researchers are using this data to compare skills content in course curricula to skills requested in job ads (Alssid, 2014), while others are using analyses of the length of time that job postings for particular jobs remain posted as a proxy for both job vacancy and skills alignment (Rothwell, 2014). The underlying assumption is that jobs go unfilled because employers are unable to find skilled workers, indicating that existing workers in the occupation do not possess the right skills or enough workers in the occupation do not exist. However, it is not clear that job postings are the best source of data on employer skill needs, and there are other explanations for jobs to remain posted online for long periods besides difficulty filling the position, such as the length of time the employer paid to post the ad. In addition, there is evidence that employer skill requirements change as labor market conditions change (Cappelli, 2014). Overall, real-time jobs data are still under development and more information is needed to fully understand their strengths and weaknesses.

New Measures Informed by Organizational Learning

Using the organizational learning framework, we address the challenge that multiple measures of outcomes are necessary to assess LMA and LMA metrics and targets vary considerably and reflect a balance of interests amongst stakeholders. Given the complexity of LMA and the inherent limitations of each measure, no one measure provides a full understanding of LMA outcomes. In addition to the weaknesses inherent in each of these methods, there is little agreement in the scholarly and policy literature regarding which methods and specific indicators are appropriate for use at the systems, institution, program, and course levels or to assess

different types of institutions with unique missions. As noted above, several studies compare graduate production to current or future job openings to assess LMA at the systems level, but this assumes that all colleges in the system have similar job vacancy alignment goals and approaches. Student employment outcomes have been used to assess LMA at the system, institution, program and course levels, but there is little agreement on how indicators should change based on the implementation level, institutional type, target labor market, or labor market conditions.

LMA metrics and targets vary considerably and reflect a balance of interests amongst stakeholders. Establishing LMA goals and objectives amid varying stakeholder priorities at different levels of LMA across multiple types of postsecondary institutions is complex. Given this complexity, it is not likely that one set of metrics will apply well in all of these circumstances. Furthermore, the lack of consensus about LMA metrics and targets may reflect the lack of consensus regarding the broader goals for LMA. While a large number of LMA stakeholders and actors are involved in implementing LMA approaches, fewer are generally involved in determining and measuring LMA metrics. Some actors, such as policymakers and funders, are most strongly interested in measuring the outcomes of LMA efforts, and may drive the decision-making process about LMA outcomes metrics and targets, to the exclusion of others. Without broad involvement, stakeholders such as higher education institutions, implementing LMA may adopt goals that are inappropriate for their missions and/or role.

Since the outcomes discussed above address one of the criteria scholars have identified for determining whether organizational learning is occurring –whether learning results in the intended outcomes (Lipshitz et al., 2007)—we also offer an organizational learning outcome directly informed by our organizational learning framework that focuses more on the collaboration among sectors to support LMA: the presence and activity level of regional or state level structures that promote engagement of higher education institutions, state policy actors, and intermediaries in alignment discussions that recognize the multifaceted nature of LMA.

New measures that account for the role of organizational learning and the corollary attention to spanning boundaries, evidence of structural and procedural arrangements to support collaboration and learning, and the ability to adapt to dynamic environments are needed. An organizational learning process can help to negotiate conflicting goals among stakeholders and facilitate a goal negotiation process that leads to measures that are meaningful and unique to the specific stakeholders at all organizational levels.

Summary and Future Directions

Current knowledge about LMA exists in a variety of domains, which all contribute important insights. Based on our review, we observe that LMA efforts share broad characteristics in common including goals related to achieving job vacancy and skill alignment outcomes in a target labor market with a target group of employers, and

leveraging organizational learning activities such as data gathering to implement changes in a variety of curricular and co-curricular areas for the purposes of achieving these goals.

With so many LMA policies and efforts already underway, there is an immediate need to take key actions to improve current implementation and accountability efforts. As such we provide some key recommendations to inform current policy and practice.

Recommendations for Policy and Practice

We make the following four recommendations for policy and practice:

1. Recognize that LMA implementation and measurement is complex and thus does not lend itself to a simple "one size fits all" approach.

   LMA in higher education may seem like an easy-to-implement policy solution to large economic challenges, such as high unemployment, employer concerns about skills shortages, and high student debt levels. As this chapter demonstrates, however, it is much more complex. The variety of institutional types, levels of implementation, stakeholder perspectives, and a lack of reliable data on supply and demand make LMA an issue without a precise, engineered solution. LMA does not lend itself to a simple, "one size fits all" approach. Rather, it involves the alignment of many actors across multiple institutions and organizational levels in a complex and dynamic process that seeks to balance multiple—and sometimes competing—stakeholder needs amid shifting labor markets and policy environments. LMA efforts share broad characteristics in common, but vary significantly in their goals, implementation and measurement.
2. Recognize the variety of LMA approaches and metrics for different institutional types, levels of implementation, and stakeholder goals.

   Community colleges vary significantly from four-year institutions in their educational scope and mission, as well as many other factors, including the incentives they receive to pursue LMA goals. It is not surprising, therefore, that community colleges may require an LMA approach, and a set of outcomes, that is distinctly different from that which administrators at a four-year institution would adopt. Similarly, the activities and outcomes one can expect from a system of institutions may be distinct from those that would be expected at a different level of implementation, such as the institutional or program level. Even within institutional types and units of analysis (levels of implementation) that are compatible, local stakeholder needs and other factors lead to a wide variety of different LMA goals. These unique goals, actors, and implementation settings place boundaries around the specific activities that LMA actors pursue. As a result, there are likely to be sets of LMA activities and outcomes that apply better in some settings than in others.

3. Use multiple metrics to assess LMA policies and promote experimentation with strategies even in the current accountability climate.

   Postsecondary institutions are being held accountable to metrics set by external actors. However, without consensus on the specific goals for LMA, or research that clearly links strategies to outcomes, practitioners are at a disadvantage, left to experiment with untested strategies under the pressure of potentially losing funding if certain metrics are not met. Multiple barriers exist to understanding the skill and workforce needs of employers, from problems of data reliability and validity, to shifts in employer needs caused by changing labor market conditions, to a lack of agreement among employers regarding skills standards, priority skill needs, or job vacancy estimates (Cappelli, 2014).
4. Promote dialogue across organizational boundaries to include myriad stakeholder groups to develop a clearer consensus regarding LMA goals, approaches, and metrics for different institutional types and levels of implementation.

   Given the range of goals, approaches, and metrics for LMA, it is not surprising that the concept is not well understood or agreed upon amongst stakeholders. This chapter is not meant to advocate for one form of alignment over another, or even to suggest that alignment, in the engineering sense of the word, is an achievable goal. Rather, our hope is to increase awareness of the complexity and difficulty of attempts to align higher education and a dynamic labor market, as well as to provide a new framework that build upon models used in the scholarly literature to describe the many forms of LMA across higher education. Given the language in this framework and its examples of approaches and outcomes, stakeholders may benefit from engaging in discussions to clarify their priorities and identify LMA approaches and metrics that are most appropriate for their needs. Without better dialogue and consensus across the many stakeholder groups involved in supporting and implementing LMA regarding the goals and objectives for LMA in different settings, it will continue to be difficult to reach consensus on appropriate outcomes metrics and methods. Below, we suggest seven areas for future research.

Recommendations for Research

Several gaps remain in our understanding of higher education LMA, which necessitate further research to guide policy and practice with deeper evidence on how to effectively approach and measure LMA. Ultimately this research can promote better policy and practice, leading to improvements in the way higher education prepares students for the workforce.

1. Conduct comprehensive outcomes research tied to activities on job vacancy and skills alignment.

   Without rigorous outcomes-based research, it is hard to know if LMA efforts have a meaningful impact for students, employers, and others. There is also no

evidence regarding which approaches, at which levels of implementation, balance the needs of stakeholders and alignment actors well. A comprehensive understanding of higher education LMA must start first with a consideration of the entire set of goals and priorities that programs seek to balance when they start an alignment process. Research is needed to identify particular models of LMA, and their constituent parts, that are linked to multiple outcomes measures. This research would identify the actual mix of program practices that lead to credentials with real value in the labor market as quantified through multiple measures. This type of rigorous research will be complex, reflecting the complex nature of LMA, but is much needed by the field. More evidence on how higher education can address the issue of LMA will help policymakers and practitioners develop strategies that make sense given their unique stakeholders and alignment goals and priorities.

2. Identify alignment approaches that balance well with other core higher education missions, particularly for liberal arts institutions.

   Research needs to further examine how institutions have sought to balance the goal of LMA with other institutional goals such as civic education and students' academic advancement goals. Since little work has been done on LMA for liberal arts programs and some of the greatest concerns relate to this population, this is an area that is ripe for new research. How much skills alignment is too much? For which types of students? In which types of labor markets? What skills are the most critical to align closely with to ensure successful outcomes? Helping liberal arts students prepare for careers does not have to be inconsistent with the goal of a liberal arts education. More information on and discussion of potential models might help colleges better integrate these approaches into liberal arts programs.

3. Uncover the organizational learning processes that support alignment implementation in different settings.

   The activities related to the implementation of alignment are not well understood. Organizational learning provides a framework to begin to understand these processes. Different types of institutions (i.e., two- and four-year, workforce, and liberal arts) may use different processes as a result of their differing missions, and more understanding of these is necessary. While much work on activities related to labor market responsiveness has been done in community colleges, much less has been done to study LMA in four-year institutions, university graduate and professional programs, and other settings. Even in community colleges, a great deal is not known about specific approaches, such as how college faculty and staff use labor market data and advisory board feedback in program development and reform, or how colleges reconcile conflicting data or interests among parties. Identifying the OLMs that support alignment in different postsecondary sectors is crucial to the effective implementation of LMA.

4. Identify approaches to integrate career preparation for all students.

   A major challenge to implementing alignment activities is a lack of understanding around students' needs and how they can be best supported. While students broadly seek education to promote success in the workforce, how to best

guide them toward that goal is not well understood, especially given the unprecedented economic context. Greater general knowledge is needed on students' decision-making processes and how higher education can provide the right supports at the right time to promote students' career preparation. More specific research is needed on how students access and evaluate labor market data and whether particular interventions, such as providing more data, requiring classes on careers, or providing more advising and counseling, may improve students' decision making and ultimate career success.

5. Improve understanding of employer perspectives in engagement and hiring practices.

   Employers play an important but often understudied role in LMA. A better understanding of how employers understand and engage with higher education is needed to answer numerous questions. How do they engage with higher education and why? How much should higher education change based on industry versus try to engage and shape industry? How can employer advisory boards be conducted to best support alignment goals? A deeper understanding of the hiring process is needed to answer questions around employer behavior that explains particular outcomes and the role of credentials in hiring. What meaning do employers assign to credentials, and how do they form these meanings? This may be a particular issue in fields with emerging credentials: How do they take on value and meaning among employers?

6. Evaluate and validate several sources of demand- and supply-side data for use in job vacancy and skills alignment.

   LMA actors across different organizational levels rely on a range of labor demand and supply indicators from traditional labor market data, "real-time" jobs data, and higher education graduation data sources, among others. However, there is little understanding about which of these indicators, or combinations of indicators, has the best predictive power for the purposes of job vacancy and/or skills alignment. In particular, many alignment actors are moving to use "real-time" jobs data as an indicator of job vacancy and skill demand. However, no research or evaluation has been done on these data to validate their accuracy and utility, or identify their potential limitations. For example, it is possible that certain occupations or regions may have more or less accurate job posting data and this will need to be used with greater caution than data for other occupations or regions. In addition, further research may reveal a method of triangulating data to help LMA actors maintain a grasp on broad trends, to help avoid significant under- and over-supply issues.

7. Explore the structures and processes that support the development of shared meanings and goals across organizational boundaries and among stakeholders with different, and frequently competing, goals.

   As we have proposed, an organizational learning perspective on LMA emphasizes the socially constructed meaning of alignment and desired outcomes. As a result, research is needed to understand how to promote a collaborative learning process that spans organizations and sectors while accounting for the fundamentally different paradigms stakeholder hold about the purpose of higher education and how the labor market functions.

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