Reconceptualizing Learning: A Review of the Literature on Informal Learning

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Education and Employment Research Center

ACT FOUNDATION™

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April 2016

Prepared for the ACT Foundation

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ACKNOWLEDGEMENTS

The authors would like to thank Tobin Kyte of the ACT Foundation for his on-going support and guidance throughout this project; Roy Swift, Debra Bragg, Sue Schurman, Thom Powell, Mary Murphree, and Heather McKay for their helpful feedback on earlier drafts of the paper; Steven Malick and Justin Vinton for their skillful research assistance; and Leni Silverstein for editorial assistance. The authors are solely responsible for any errors.

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EXECUTIVE SUMMARY

Given the importance of learning to economic and life success, this review seeks to broaden the conception of learning beyond traditional formal education. Learning occurs every day in many ways and in a range of settings. This broad scope of learning—termed "informal learning"—is increasingly important in the rapidly changing knowledge economy. As such, in this review paper, we examine the different types of informal learning, their opportunities and challenges, and their issues of access and equity. Spanning multiple disciplines, we draw particular attention to the workplace and adult learning literature. This meta-review is a synthesis of over 600 publications with a focus on review articles published in the last 25 years.

I. Broad Overview of Informal Learning

A useful framework for understanding informal learning is to view learning as occurring on a continuum of formality based on the following attributes: the *location* in which learning occurs, whether learning is *instructor* or *student led*, the extent to which the *content* learned is an organized curriculum, and one's *purpose* for seeking knowledge. Learning that is most formal can be characterized as learning that occurs in schools that award credentials, is instructor led, covers an organized curriculum, and where knowledge is intentionally sought. Based on this framework, we categorize informal learning into broad categories. Organized informal learning can occur in a range of settings including schools, work, the community, and home. It is intentionally sought by learners, employs a curriculum and an instructor, but does not lead to an educational credential. Everyday informal learning also takes place at school, work, community, or home. It does not include an instructor or an organized curriculum, and learners have a range of intentionality in which the learning can be self-directed, incidental, and/or embedded in the process of socialization.

Learning occurs in a variety of ways across the continuum of learning formality. A few of these ways are particularly common with informal learning: experiential, relational, and situated learning. Situated learning attends to the influence of the context in which learning occurs. Both experiential learning, learning through action, and relational learning, learning from others, are related to situated learning. In addition, technology has an important role in how learning occurs across all types of learning. Through opportunities such as online learning, massive open online courses (MOOCS), games and simulations, and mobile learning, technology may expand access to learning opportunities. At the same time, access to the Internet differs by socioeconomic status, and attrition rates for some of these opportunities are high.

Informal learning, like formal learning, has issues with access and equity. Not all individuals are able to access and benefit from informal learning. A variety of characteristics, including cognitive ability and motivation, influence how much an individual can take advantage of informal learning opportunities. Those individuals with more education and often greater levels of self-efficacy are able to benefit the most from informal learning. Furthermore, traits such as age, gender, and disability status have been shown to influence access to these

opportunities. In addition, because many informal learning opportunities occur in the workplace, sometimes a tension exists between individual goals, such as growing and developing as a worker, and an organization's goals of increased employee productivity. In contrast to this organizationally driven approach of some workplace learning, the approach of transformative learning can promote social change by promoting awareness of power dynamics in society.

II. Specific Types of Informal Learning

Given the continuum of learning formality and our broad categories of informal learning, we discuss each of the specific subtypes of informal learning that compose the broad categories of organized informal learning and everyday informal learning. For each subtype of informal learning under the two broad categories, we provide an overview of opportunities, challenges, and implications for access and equity.

Organized informal learning includes several subtypes of learning, including noncredit learning, work-based learning, service/civic learning, mentoring/coaching, and communities of practice.

- *Noncredit learning:* Learning that takes place in a class but not for academic credit offers flexibility and opportunities for lifelong learning in a low-pressure environment. Yet, the lack of credential and uneven opportunity across individuals are this type of learning's chief limitations. Examples of noncredit learning include noncredit college programs and employer-sponsored education.

- *Work-based learning.* Work-based learning is learning that occurs on the job but that is organized as a deliberate site for learning. It provides opportunities for socialization into a profession and is useful for clarifying career choices. Challenges to the quality of work-based learning include that training is not standardized and may not align with the curriculum being taught in the classroom. Several common ways a learner can participate in work-based learning include:

    - *Apprenticeships*: Paid training where a novice employee is taught by a master.
    - *Clinical*: Unpaid worksite experience in a clinical setting.
    - *Cooperative Education*: Work experience connected with an educational program, where the learner rotates between work and education.
    - *Internships*: Work experience—in a variety of forms—it can include a term-length placement with an organization with both faculty and company supervisors; it can also include work with the purpose of gaining experience that is not linked with education.

Other less-intensive work-based learning experiences consist of school-based enterprises (i.e., school-owned businesses operated by students), job shadowing, and career academies (i.e.,

"small, career-oriented 'schools within schools' that integrate academics, career exploration, occupational preparation, and sometimes work experience"). These focus on career exploration.

- *Service/civic learning* is learning that occurs when an individual volunteers in a community as part of a structured learning experience. In particular, service learning is shown to be instrumental in the worker's development of cross-cultural competencies, fostering positive attitudes toward learning and facilitating a return to formal learning. Unlike service learning, where volunteering to address the needs of a community is essential, *civic learning* can take place in both formal and informal learning environments and focuses on civic engagement and democracy building. Finally, *volunteering* is another important pathway through which informal learning occurs. The main distinction between service/civic learning and volunteerism is that volunteering does not explicitly focus on the educational outcomes. A drawback of these types of learning is that the learning can be temporary and access can be unequal.

- *Mentoring/Coaching*: A common form of learning at work, mentoring involves a more experienced worker acting as a teacher, adviser, and sometimes advocate for a less knowledgeable worker—the mentee. Similar to mentorship, peer-to-peer learning is comprises employees at the same level of career seniority, sometimes referred to as co- or peer mentoring. Also similar is coaching, which includes executive and group coaching. Group coaching refers to the coaching of multiple employees at once, and executive coaching is the training of company leadership to maximize personal potential and company profit. Individual goals include that workers gain the knowledge they think is relevant, while organizations benefit from the worker's greater connection to the profession and often employer. This type of learning often has little quality control and unequal access, so only a few people benefit.

- *Communities of Practice*: The set of relationships that exists around a body of knowledgeis sometimes referred to as a professional learning community. Learning takes place through interactions between workers in the group in which collective learning occurs related to the shared profession. Within this process, knowledge is shaped by the workplace and cultural norms. Like mentoring and coaching, communities of practice provide workers with relevant knowledge and greater connection to their workplace; however, they may be of varying quality and suffer from unequal access.

Everyday Informal Learning: Everyday informal learning is learning that occurs during the course of daily life. Particularly in the workplace, a majority of the learning is informal. Employees who learn this way often have greater human capital, are more employable, and benefit from better relationships between colleagues and managers. Unequal access to learning opportunities, difficulty in accrediting this type of learning, and narrowly focused learning where the worker only learns non-transferrable superficial skills are the limitations of everyday learning. Three, sometimes overlapping, subtypes exist:

- *Self-directed learning:* Occurs when the learners take the initiative and actively seek a learning opportunity or information on their own.
- *Incidental Learning*: Learning that occurs in the normal course of daily events without a high degree of design or structure, but the learner does not have awareness that he or she is learning before the experience takes place.
- *Tacit Learning*: Learning that occurs beyond the individual's awareness and relies on the learner's cognitive frameworks to transform information into knowledge.

III. Understanding the Impact of Informal Learning

To understand the impact of informal learning, we examine efforts to measure its occurrence and mechanisms to recognize and translate it into value for the learner. We conclude with an overview of the implications of informal learning and unanswered questions.

We provide an overview of the efforts to understand the impact of informal learning. We find that there have been a number of national and international efforts to measure informal learning through surveys over the last 20 years. It is worth noting that there has been little to no attempt to measure the most informal ways of learning. This overview underscores that there is a need for more wide-scale and in-depth study that will provide a more complete understanding of informal learning.

We identify four strategies for recognizing informal learning. Some strategies allow for translation into credentials, whereas other strategies result in direct benefits to workers on the job, and the final strategy brings together both educational credentials and rewards at work.

Prior learning assessment (PLA) is designed to take the skills and competencies adult learners develop through their work and life experiences and translates these skills and competencies into formal academic credit, which can then be applied toward completion of a degree. Recognizing informal learning through PLA can be beneficial to promote a more formally educated workforce because PLA improves access to higher education and streamlines the completion of a post-secondary degree or credential for adult learners.

Industry Certifications and Licenses are credentials obtained through an examination process. Industry certifications are based on examinations that are created by industry groups to validate a set of specific skills required for an occupation. Licenses are required for practice in certain occupations and can be based on examinations of skills and other factors such as work experience and/or educational credential attainment. The value of industry certifications in particular is unclear, but there is some evidence that licenses are linked to higher wages.

Workplace Rewards refers to informal learning that may be recognized through existing structures in the workplace that lead to career advancement. While premised on the notion that a worker can advance his or her career within an organization, this strategy is becoming less

common. Beyond career advancement, this strategy has also been linked to higher wages and increased productivity in the workplace.

Learn and Earn Models are partnerships between postsecondary educational institutions and employers to provide opportunities for adults to attend college while maintaining their careers. These programs take forms ranging from internship and co-ops to work study programs and career and technical education.

We conclude this section by reviewing the implications of informal learning and posing pressing questions that this review of the literature cannot address. We hope to spark a dialogue to work toward a more comprehensive understanding of informal learning by seeking to understand how to improve the measurement of informal learning and enhance the impact of informal learning.

INTRODUCTION

Learning is fundamental to an individual's economic and life success in today's society. Although few would dispute this statement, many would debate the exact definition of what constitutes learning. Learning is typically associated with the education system—located in a classroom in a school, and leading to an educational credential. The U.S. education system and its product—referred to as "formal learning"—are the focus of a great deal of media attention, public concern, government policies, and private investment, and is seen as the major venue to improve individuals' economic success and to address the needs of a changing labor market. Yet learning occurs every day in a multitude of ways and in a range of settings. This learning—often referred to as "informal learning"—has an impact on individuals, organizations, and the economy in many ways that can significantly promote economic success and a robust economy.

Ideas about the role of informal learning are evolving. With a more rapidly changing labor market and the growing importance of the knowledge economy, the concept of lifelong learning has emerged in recent decades (Glowacki-Dudka & Helvie-Mason, 2004; Kessels & Kwakman, 2007). From this perspective, ongoing learning is viewed as essential, as workers are compelled to build and rebuild their knowledge and skills (Lester & Costley, 2010; Livingstone, 1999b) to maintain their livelihoods. Although lifelong learning is typically motivated by labor market concerns, it also applies to the broader concept of ongoing learning throughout the lifespan for personal and social fulfillment(Sheridan, 2007). In addition to changes in the economy, changes in technology have transformed the modes of learning available to learners. With the proliferation of technology—specifically home computers—vast amounts of information are available to learners with access to the Internet; inevitably, the tools available for learning are also changing. Furthermore, within the traditional education system, many are seeking ways to reform and improve learning to better prepare students for workforce and life success.

With this shifting context for learning in mind, we review what is known about informal learning to provide a broad conceptualization of what constitutes knowledge acquisition beyond the traditional classroom. The literature on informal learning is vast and spans multiple fields of study, including direct research on informal learning along with closely related studies of adult learning and workplace learning. Given the breadth of the relevant sources, this review focuses on key summaries of this body of work. The many literature reviews and theoretical frameworks that have been written in the past 25 years provide a basis for this review. Although many of these studies have a non-United States focus—located primarily in the United Kingdom, Australia, and Canada—the broad concepts explored have relevance to the U.S. setting. For a more detailed description of the methodology used for this review, see Appendix.

By mapping the many ways in which learning occurs within a diverse array of settings, this review employs a wide lens for analyzing potential learning opportunities. Beyond creating this map of learning opportunities, we will accomplish two primary goals: (1) identify the strengths and weaknesses associated with informal learning to provide a nuanced understanding of its

value, and (2) to examine the implications for access and equity associated with informal learning opportunities. In the first section, we provide an overview of the foundational concepts related to informal learning. In the second section, we examine a few specific types of informal learning in detail. In the final section, we consider the ways informal learning can be measured, documented, and/or translated into valuable approaches to enhance career and life success.

I. BROAD OVERVIEW OF INFORMAL LEARNING

The academic literature from multiple fields, including informal learning, adult learning, and workplace learning, provides a broad understanding of informal learning across a range of contexts. In this section, we first review the different definitions of informal learning from a variety of fields to develop a framework for understanding informal learning in its broadest sense. We then examine how informal learning occurs, including an overview of major theories of learning and an examination of the role of technology in learning. Finally, we explore the issue of who benefits from informal learning, focusing in particular on the tension between individual and organizational goals.

A. What Is Informal Learning?

Key literature reviews and theoretical frameworks from multiple fields provide a variety of definitions of informal learning. Several fields have examined informal learning, including those directly focused on informal learning (Colley, Hodkinson, & Malcom, 2003a, 2003b; Misko, 2008; Schugurensky, 2000);on adult and lifelong learning (Livingstone, 1999a; Merriam, Caffarella, & Baumgartner, 2006); and on workplace learning (Eraut, 2007, 2009; Hann & Caputo, 2012; Le Clus, 2011; Manuti, Pastore, Scardigno, Giancaspro, & Morciano, 2015, Noe, Clarke, & Klein, 2014). Each field provides different ways of defining informal learning and a unique perspective on learning. For example, the informal learning and adult and lifelong learning literature typically examines informal learning from the individual learner's perspective, whereas the workplace learning literature often takes an organizational standpoint. This review recognizes the multiplicity of viewpoints in the existing literature as we review their underlying concepts and provide perspective on how to view these concepts.

Across these fields, several reviewers observed the lack of consensus on how to define informal learning and how to distinguish it from formal learning. In their review of informal learning for the British government, for example, Colley et al. (2003a, 2003b) conclude that the entire field of learning is highly debated and that the distinction between formal and other types of learning is often imprecise. Similarly, in a review of informal learning for the Australian government, Misko (2008) concludes that the boundaries between formal and other types of learning are quite blurred and can often overlap with each other. Likewise, in a review of the literature on workplace learning, Manuti and others (2015) observe that no singular definition of informal learning exists in the context of workplace learning. This lack of a clear definition may be due to the multiple goals involved in workplace learning—both for the organization and the individual—along with the multiple disciplines involved in such studies. Others have observed

that the concepts of formal and informal learning are often intertwined and overlapping in content, making it difficult to create a clear distinction between these categories (Eshach, 2007; Marsick, 2009).

1. The Continuum of Learning Formality

Recognizing the numerous ways to characterize learning, Colley et al.(2003a; 2003b) provide a useful framework for making sense of the many forms of informal learning. They observe that all learning occurs on a continuum, and contains various levels of formality and informality. They argue that although various aspects of formality and informality exist in any learning experience, learning occurs on a continuum of formality based on a set of defining attributes. They propose four attributes of learning formality: location, process, content, and purpose. We discuss each of these four key attributes of learning on the continuum in more detail below.

Location

Location is a key attribute of learning that refers to the setting in which it occurs, that is, at school, work, community, or home. When attempting to distinguish formal learning, several researchers note that formal learning is generally run by institutions and schools and takes place in classrooms (Colley et al., 2003a, 2003b; Le Clus, 2011; Livingstone, 1999a; Merriam et al., 2006). Colley et al.(2003b) consider the formality of the location where the learning is taking place. Even as they observe that non-educational settings can have "strongly formalized dimensions," they note that schools and colleges are locations associated with a particular kind of formality intrinsically linked to education, whereas the workplace, the local community, and family are locations associated with informality (also Schugurensky, 2000). Within the context of workplace literature, Jacobs and Park (2009) describe the location of learning as either off the job, away from the work setting (typically in a classroom not the workplace), or in the work setting in circumstances not specifically designated for learning.

One important attribute closely linked to the location of formal learning is the ability of the learner to receive an educational credential, degree, or other externally recognized symbol as a result of formal learning. Merriam et al. (2006) note that formal learning often "leads to degrees or some sort of credit." Whether or not learners receive academic credit for their work is an important attribute of the formality of learning. According to Misko (2008), a formal qualification is a principal characteristic that defines formal learning.

Educational institutions have the unique authority to confer credentials, including degrees and certificates. These institutions are legally granted the right to confer these credentials by either the state government, the federal government, or a tribal entity (Contreras, 2009). Additionally accreditation agencies seek to review and ensure the quality of these institution and to uphold standards and practices (New England Association of Schools and Colleges, 2006). Although many other credentials exist, such as industry certifications and licensure, the credentials conferred by educational institutions are a strong basis for defining and bounding formal

learning. They reflect the influence of accreditation bodies and internal institutional processes that promote formal education practices regarding curriculum and instruction. Other credentials, particularly industry credentials, are not tied directly to one institutionalized form of learning but rather provide an opportunity to document learning beyond such formal learning, as described in further detail later in this paper.

Process

The process through which learning occurs can distinguish its degree of formality. In particular, one distinguishing characteristic of formal learning is the involvement of an instructor or facilitator and the extent to which he or she directs the learning process, rather than the learner's controlling it. Colley et al. (2003b) identify the presence of an instructor who directs the learning and provides pedagogic support as a crucial process element that differentiates among types of learning. In his view, the most formal learning includes an instructor, whereas less formal learning has a trained mentor or counselor, and even lesser formal learning may involve a friend or a work colleague sharing knowledge. Further, Livingstone (2001) notes the different roles that an instructor can play in learning—from the most formal, where a teacher decides whether a learner has mastered the pre-established curriculum/body of knowledge, to somewhat less formal, where the teacher is involved with instruction but does not rely on a predetermined curriculum, to an even less formal situation, where no instructor is present. However, the recent reform efforts within the formal education system to make learning more learner led are blurring the distinctions between formal and informal learning (Colley et al., 2003b).

In the workplace learning literature, Jacobs and Park (2009) describe the role of the facilitator as either being passive and having a limited role in the training process or having a more active and direct role in the learning process. LeClus (2011) discusses informal learning as allowing the learner to construct meaning of a concept rather than have the meaning given by an expert. Likewise, according to Noe et al. (2014), informal learning occurs when the learning is driven by the learner rather than the instructor.

Content

The nature of the content that learners engage with is an important attribute in defining the formality of learning. Merriam et al. (2006)distinguish between learning that has a curriculum and learning that does not. Livingstone (2001) refers to formal education as having a pre-established or externally imposed curriculum, whereas informal education concerns itself with situational learning or content that is chosen by the learner. Colley et al. (2003b) use the term "content" to describe formal learning as focused on established expert knowledge, understanding, and practices, whereas informal learning is experience based. Livingstone (2001) contrasts knowledge as ranging from a pre-established body of material that is rational and cognitive (formal) from that acquired from an externally organized curriculum that is situational and practical (informal). Formal learning, particularly acquired at universities, deals

with "codified knowledge" published in books or journals; in contrast, cultural knowledge, which has not been codified, is important in work-based learning (Eraut, 2007). According to Jacobs and Park(2009), in the context of the workplace, learning is viewed as unstructured versus structured. Thus, the formality of the content of learning can be distinguished by whether or not the learning is part of a preexisting canon or standard body of knowledge or whether it emerges from situational or practical needs and concerns.

Related to content of learning are the outcomes of learning. Learning that is considered formal often includes "expert" or "high-status" content that is preestablished and often has rigidly determined outcomes. Somewhat less formal learning is more flexible and has negotiable outcomes. In the most informal of learning, where the content emerges from recognizing the knowledge derived from experience and everyday practice, outcomes may appear less systematic and more serendipitous (Colley et al., 2003).

Purpose

Learners may engage in learning for a variety of reasons. Learners may be interested in acquiring knowledge, a new skill set, or obtaining a credential. Alternatively, they may not even be aware that they desired a learning outcome or were even engaging in learning. Colley et al. (2003b) describe purpose as that attribute concerned with the formal intentions of the learning itself—that is, the extent to which "learning is the prime and deliberate focus of activity." Whether learning was a principal goal or an unintended outcome of the activity is a key distinction in the level of formality (Colley et al., 2003b). Furthermore, among learning experiences not intentionally sought, a distinction is made based on whether the learner realizes that learning occurred or not (Schugurensky, 2000).

In the context of workplace learning, Perrin and Marsick (2012) describe informal learning as a continuum ranging from intentional to incidental learning. Intentional activities include learning review, coaching, and on-the-job-training. Less structured but still intentional activities include knowledge sharing, mentoring, self-study, job aids, and electronic performance support systems. Incidental activities include those in which workers learn from each other and engage in spontaneous learning, including job shadowing/job sharing, role modeling, reflection, teaching, networking, and "water-cooler" learning. Doornbos, Bolhuis, and Simons's (2004) model of work-related learning includes intentionality as a key characteristic where learning may be unplanned, happening spontaneously during an activity, or deliberately sought out by the learner.

2. Definitions of Informal Learning

The continuum of formality of learning relates to several broad categories of learning. Table 1 summarizes the continuum of learning formality, as adapted from Colley et al. (2003a; 2003b); three broad categories of learning emerge from the literature as they relate to the continuum. The most formal learning occurs in traditional, classroom-based, accredited educational

institutions that issue credentials. Further along the formality continuum is the somewhat less formal learning, the type that we refer to as organized informal learning. Such learning occurs intentionally in organized settings and includes both classroom-based and non-classroom-based settings, but without the traditional format of credentialed education. Finally, the least formal learning occurs during everyday informal learning, which includes a range of learning including self-directed learning, incidental learning, and tacit learning or socialization.

These categories are not absolute, and the types of learning overlap one another. For example, everyday informal learning can and does occur within the context of formal learning. However, these broad categories provide a framework for organizing and discussing types of learning. Using this framework, we examine each of these broad categories of learning, analyzing their definitions based on the literature. Later, in Section II, we elaborate the specific subtypes of learning within these broad categories.

Table 1. Continuum of Learning Formality, adapted from Colley, Hodkinson, and Malcolm (2003b)

	Formal learning	Organized informal learning	Everyday informal learning		
			Self-directed learning	Incidental learning	Tacit learning
Location	School awarding formal credential	School not awarding formal credential, work, or community	Work, community, home	Work, community, home	Work, community, home
Process	Instructor led	Instructor led	Learner led	Contextual	Contextual
Content	Organized curriculum	Organized curriculum	Learner organized	Spontaneous based on need	Social norms and practices
Purpose	Intentionally sought	Intentionally sought	Intentionally sought	Not intentionally sought but aware after	Not intentionally sought, not aware after

Formal Learning

Although this review does not focus on formal learning, we use formal learning as a recognized heuristic that, by contrast, enables greater understanding of informal learning. We explore this concept to provide a comparative shared basis for understanding the continuum of learning. A

variety of attributes from the continuum of learning has been used to describe formal learning, as summarized in Table 1. Merriam et al.(2006) highlight the social context in which learning occurs as essential to defining learning, and conceptualize formal learning as that which occurs in the classroom with a curriculum. Livingstone (2001)defines formal learning by its form of delivery—with a teacher, an authority figure who uses a curriculum containing a preestablished body of knowledge. Schugurensky (2000) defines formal learning as highly institutionalized and hierarchical with a prescribed curriculum and prerequisites for entry into classes; another chief defining characteristic is that a diploma or certificate is granted upon successful completion and mastery of the material. Alternatively, within the workplace, classroom-based training with a curriculum is referred to as formal learning (Jacobs & Park, 2009; Le Clus, 2011; Sambrook, 2005). Because this literature focuses only on learning in the workplace, a critical distinction is between classroom-based learning offered in the workplace and learning that occurs during the everyday experiences of work.

For this review, we define formal learning as that which occurs in a school and leads to an educational credential. Typically an instructor facilitates such learning and has an organized curriculum based on an established body of knowledge. Although we will refer to this definition of formal learning, we recognize that certain reform efforts within the formal education system seek to make learning more learner led, for example, online learning and competency-based learning. In addition, credit for prior learning provides opportunity for the credentialing of informal learning. Thus, the distinctions between formal and informal learning are not perfectly clear, as Colley et al. (2003b) observe.

Organized Informal Learning

Organized informal learning is a broad category that includes a range of learning experiences that are organized with a curriculum and an instructor but do not lead to a formal educational credential. (See Table 1.) For the purposes of this review, the defining characteristics of organized informal learning are that it is institutionally sponsored and organized, offering both a curriculum and an instructor. It may lead to a non-degree educational award that may or may not have value in the labor market. Examples of organized informal learning include noncredit workforce education courses offered by community colleges; workplace training offered by employers; and work-based learning experiences, such as internships or job shadowing experiences. Although we define this category as such, we recognize that there is no clear consensus on this category of learning.

Within the literature, organized informal learning is sometimes referred to as nonformal learning, though this term has varying meanings, as discussed above. Within the adult learning literature, Merriam et al. (2006) describes nonformal learning as classroom based with a curriculum and a facilitator but short term and voluntary with little to no prerequisites and occurring outside the formal education system. Schugurensky (2000) defines nonformal learning as all organized education programs outside the formal school system that have teachers and curriculum (with varying rigidity), no prerequisites, and sometimes a certificate of

attendance.[1]Examples of all these definitions of nonformal learning include adult basic education classes to promote literacy and numeracy along with avocational classes for adult to learn new skills such as photography.

The literature on informal learning in the workplace offers similarly mixed conceptions of nonformal learning. Misko (2008) describes nonformal learning as structured programs to impart knowledge that do not lead to a recognized credential; these often take the form of semi-structured workshops that convey information on skills needed for a job. Hann and Caputo (2012) describe nonformal learning as including a wide range of learning at work through on-the-job training provided to workers, such as mentoring, coaching, observation by a supervisor, job rotation, and e-learning, along with self-guided activities such as reading, researching, problem solving, and sharing resources.

Everyday Informal Learning

Everyday informal learning includes learning that emerges from the context of work and/or life experiences. We define everyday informal learning by a few of the key attributes in the continuum of formality. First, the process is directed by the learner or results from the context rather than from formal instruction. Another is that everyday informal learning is grounded in practice and ongoing experiences; it does not have a codified curriculum based on an established body of knowledge and is not located in an institution.

Conceptions of everyday informal learning have emerged from studies on adult learning, informal learning, and workplace learning. Merriam et al. (2006) define informal learning as spontaneous, unstructured, and occurring in daily life across all settings and with no curriculum. Livingstone (2001) identifies these same as part of informal learning and also notes that it encompasses the socialization or learning that generally occurs without awareness. Similarly, the workplace learning literature defines informal learning as occurring spontaneously through everyday activities and interactions with others (Hann & Caputo, 2012; Le Clus, 2011; Misko, 2008; Sambrook, 2005). It is not formally integrated into a learning program or activity by the employer's using a predefined body of knowledge, but rather, it is motivated by everyday activities or needs, occurs through idiosyncratic processes, and may or may not be conscious or planned.

Given the wide range of conceptions of everyday informal learning, others have sought to further refine the concept of everyday informal learning. Schugurensky (2000) identifies three subcategories that fall within our conception of everyday informal learning: self-directed learning, incidental learning, and socialization/tacit learning. These vary depending on the

[1]The term nonformal education is also commonly used to describe education outside of the formal educational system that occurs in developing countries as part of international development efforts (Coombs, 1973, 1985; Rogers, 2004). Another use of the term describes "second-chance" opportunities for education within developed countries, such as adult basic education programs (Garrick, 1998).

intentionality of the learner's motivation to seek out knowledge. Self-directed learning occurs when the learner actively seeks out knowledge and is aware that learning has occurred. In contrast, learning may occur in two ways without the learner's intentionality. With incidental learning, the learner does not intentionally seek out knowledge but knows after the fact that learning has occurred. With tacit knowledge and/or socialization, the learner does not seek out the learning and is unaware that learning has occurred. These subtypes of everyday informal learning are discussed in greater detail in Section II.

In the workplace, everyday informal learning often coexists in concert with formal classroom learning. A combination of learning with varying degrees of formality can be useful in the workplace; that is, formal classroom training—offered internally and externally—can complement on-the-job experience for beginning workers as well as more experienced incumbent workers (Misko, 2008). Likewise, in discussing work-related learning (which is different from work-based learning), Sambrook (2005)offers the distinction between learning *at work* versus learning *in work*. Learning at work tends to be more formal learning, such as informational courses that occur away from the job. In contrast, learning in work tends to consist of the more informal processes embedded in regular work activities, such as asking questions, observing, working, coaching, and problem solving.

Re-conceptualizing Informality

Some scholars in the field of workplace learning are critical of the use of definitions derived from formal learning studies to define workplace learning. Billett (2002) observes that workplace learning is often conceptualized and judged relative to formal learning in educational institutions, with workplace learning sometimes implicitly defined as lesser in value. The terms informal, nonformal or unstructured sometimes imply something negative about workplace learning: that it lacks teachers, classroom-like interactions, or a formal curriculum, and thus, these experiences appear lesser, ad hoc, or questionable (Billett, 2002, 2004). Likewise, Hager (2004) observes that learning at work is often examined through the lens of formal learning. Such an approach seems to assume that the mind is something empty that needs to be filled in a structured way, a notion based on the idea that knowledge exists as the information included in curriculum and textbooks, passed on from teachers to students, and measured by exams.

Through this lens, workplace learning may aptly be defined as ad hoc or unstructured, but this may be an inadequate representation. There is structure in workplace learning, given the need to ensure that workplace practices occur with continuity and are guided by workplace norms; these practices may be highly structured to ensure that workers know how to perform specific tasks (Billett, 2002, 2004). Structures can be specific to the organization, whereas opportunities to learn can vary across organizations, depending on the degree of worker participation and range of tasks required. Rather than define workplace learning in relationship to the formal learning that occurs in the education system, Billett (2002) argues that learning is the result of engagement in practice—and that this occurs regardless of the social institution in which

learning occurs. Schools view learning as their primary mission, but workplaces too have institutionalized reasons to promote learning. To best recognize these structures that guide learning, others argue for a broader conception of learning that is based in the context of the workplace (Doornbos et al., 2004; Nieuwenhuis & van Woerkom, 2007).

B. How Does Informal Learning Occur?

Despite the differences in these broad categories of learning, many similarities in the way that learning actually occurs exist. A variety of perspectives on how learning occurs exists, including those that are often associated with formal learning in a traditional setting and with everyday learning in a range of settings. Furthermore, technology shapes the ways that people learn, regardless of the ways that learning occurs. In this section, we first discuss several foundational theories on learning that provide insight into how learning, particularly informal learning, occurs. We then analyze the role of technology in learning and how technology affects informal learning in particular.

1. Theories on Learning

When examining informal learning, constructivism provides an influential perspective through which to view the ways that learning occurs. People are not empty vessels to be filled with knowledge, as traditional educational pedagogy based in behaviorism once assumed (Bransford, Brown, & Cocking, 2000). Rather, people bring prior knowledge and understandings to situations, and learning occurs through active engagement and integrating new learning with their baseline experiences. Many of these ideas were influenced by philosopher scholars such as Dewey (1938) and Piaget (1985), who focused on experiential aspects of learning, as did others like Vygotsky (1978), who looked at the social aspects of learning. Ideas of learning were further advanced by such theorists of adult learning as Knowles (1975, 1984) and Tough (1978), who highlighted several essential features including the connection to prior experience and knowledge. The idea of learning as a mechanism to promote deep personal and social change is promoted through the perspective of transformative learning (Mezirow, 1997).

In their systemic review of the literature on learning, Bransford, Brown, and Cocking (2000) discuss the importance of understanding rather than memorization as a goal of learning. Understanding occurs when information is organized around key concepts and can be applied in a variety of contexts. They observe that learning builds directly off prior knowledge and can occur through many different teaching approaches in formal learning settings. These approaches include lecture-based approaches, technology-enhanced approaches, group learning, inquiry-based approaches (i.e., cases, problems, projects), and skills-based approaches (drill and practice, contextualized practice, and modeling). No one single type of learning is best—each has its time and purpose, but in all cases, the common goal is to convey understanding of a body of knowledge.

Theories of learning are not strictly associated with the types of learning on the continuum of learning formality, though some are more highly connected with informal or formal learning. Among the numerous theories on learning, active learning is most commonly discussed as a best practice in formal learning. Several other theories on learning are often discussed in relation to informal learning, including situated learning and its related approaches: experiential learning and relational learning. Whereas these theories or ways of learning are described as distinct forms, they often co-occur and overlap each other in a complementary fashion. Thus, they cut across the continuum of learning, occurring in all categories of learning. Furthermore, some emerging reforms are changing how learning occurs. For example, competency-based learning is changing how formal learning occurs by integrating forms of learning that more commonly occur in less formal settings, such as experiential and relational learning.

Active Learning

An important dimension of learning is the extent to which learning occurs passively or actively. In the past, formal learning had been more passive and lecture based, but increasingly, it includes a variety of forms of active learning. Passive learning activities expose students to new knowledge through rote memorization and direct instruction. In contrast, active learning activities require students to engage more directly with the learning material. The instructor's role in passive learning is that of an expert who imparts knowledge, whereas the instructor's role in active learning is that of an expert who designs and facilitates learning experiences (Smith, Sheppard, Johnson, & Johnson, 2005).

Overall, active learning is considered a best practice in education (Chickering & Gamson, 1987; Prince, 2004; Smith et al., 2005; Terenzini, Cabrera, Colbeck, Parente, & Bjorklund, 2001). Active learning strategies that incorporate reflection, guided engagement, problem solving, constructive learning, or interaction are more likely to encourage lasting learning than are other more passive strategies. For example, one particularly effective activity, "enhanced discovery" learning, is an approach in which students are guided by an instructor to construct meaning and knowledge (Alfieri, Brooks, Aldrich, & Tenenbaum, 2011). Not only do students benefit from opportunities to apply their learning, but also research shows that students must understand the context, relevance, and utility of what they have learned to apply this knowledge to future situations (Bransford, J. et al., 2000; Karp, Raufman, Efthimiou, & Ritze, 2015). Active learning can still include lecture-based forms intended to convey specific contentbut alsoinclude reflection, problem solving, and opportunities to apply the content (Bransford, Brown, & Cocking, 2000).

Situated Learning

Situated learning posits that learning is inherent in the environment and completely inseparable from all aspects of the real work environment (Stein, 1998). Lave and Wenger (1991) argue that learning is an integral part of social practice and includes both experiential learning and

relational learning. Based on a constructivist viewpoint, this perspective assumes that all learning occurs from the interaction of a person with his other experiences and the surrounding world. It eschews the idea that the learner is a passive recipient of factual knowledge of the world. This perspective highlights the importance of seeing learners as participants in a social context; they may not be full participants, but their "peripheral participation" in a social context is part of the learning process and moves them toward greater knowledge and eventual involvement as their learning grows. From this perception flows the idea of participation in communities of practice, broadly applied to many settings from the classroom to the most informal of learning environments.

Situated learning can occur in many contexts and is clearly related to experiential learning (Roessger, 2012). It can also be defined as learning in the social context of a specific organization, such as a workplace (Bresnen, Goussevskaia, & Swan, 2005) or more generally in the home, at a place of worship, or in the community. Situated learning can take place across the continuum of formality but is especially important for adult informal learning. Learning rooted in a specific situation or environment is better suited to the adult life experience, as adults seem to retain information better in a known context (Stein, 1998).

Experiential Learning

Experiential learning is the simple act of learning by doing. The key to experiential learning is that the learner is active and learns through actions rather than by observing (Dean & Murk, 1998; Kolb, 1984; Roessger, 2012). Experiential learning is viewed as the active process of grappling with conditions and problems in the world, constructing and testing solutions through immediate experience, and interacting with others to make sense of progress (Kolb, 1984; Moore, 2010). Building on the foundational work of Dewey (1938), Kolb (1984) developed a model for experiential learning that designates four stages of concrete experience: observations, reflections, formation of abstract concepts and generalizations, and testing the implications of concepts in new situations. In his model, experiential learning leads to increased capacity for critical thinking and engagement. Figure 1 depicts Kolb's model of experiential learning.

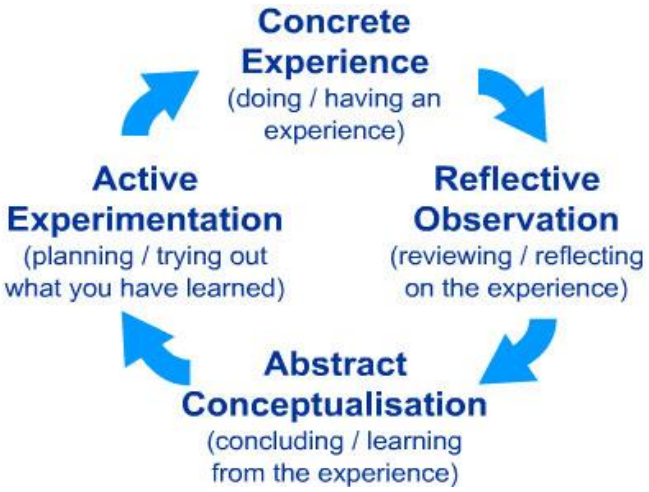

Figure 1. Kolb's Cycle of Experiential Learning (Kolb, 1984)

The act of reflection is an essential and foundational part of learning, particularly with experiential learning (Dewey, 1998; Marsick & Watkins, 1990). Reflection can strengthen informal learning experiences (Le Clus, 2011)and solidify learning of all types (Kolb, 1984). With experiential learning, learners use reflection to make meaningful connections with past practices, leading to transformative learning or to the development of a new perspective as a result of new internalized knowledge (Roessger, 2012). Under this framework, learning leads to reflection, internalization, and transformation. If a person learns something but does not put that knowledge into practice or does not maintain the knowledge over a long period, the question arises as to whether learning occurred.

Experiential learning can occur in both formal and informal learning experiences and can be directed and designed within a formal school setting through direct engagement in productive work outside the classroom (Moore, 2010). Activities can include service learning, civic learning, community-based learning, and work-based learning. Despite efforts to integrate experiential learning into formal settings, most experiential learning is learning by doing that is not planned and typically not studied. In Section II, we examine what the literature reveals about organized experiential learning activities promoted through work-based learning along with less formally organized experiential learning through everyday informal learning.

Relational Learning

Relational learning is the many ways learning occurs from others within a social context. In other words, relational learning is the sharing of language along with cultural, organizational, and community knowledge (Vygotsky, 1978). People acquire knowledge from their various social environments through observation of others—a fact of learning that occurs throughout life. Bandura (1977) coined this foundational insight of social learning theory called observational learning. Observational learning involves the selection of behavioral role models

who are emulated by the learner. Like experiential learning, relational learning can occur in both formal and informal learning situations. In the formal school setting, relational learning is frequently referred to as collaborative learning, group work, or project-based learning. Relational learning allows students to combine knowledge, increase productivity, and ultimately improve their engagement with the materials and their academic achievement (Hong, Yu, & Chen, 2011; Kalaian & Kasim, 2014; Kirschner, Paas, & Kirschner, 2009).

While relational learning in formal settings is often studied, it regularly occurs in less formal settings as well. Relational learning may include learning in small groups (Kalaian & Kasim, 2014), from peers (O'Neil & Marsick, 2009), or from a mentor (Schunk & Mullen, 2013). In the workplace setting, such learning may be called learning communities, communities of practice, or professional learning communities (Servage, 2009). All require communication and some reciprocal sharing in the workplace and other settings (Hong et al., 2011). These specific types of relational learning are discussed further in Section II.

Relational learning can lead to reflective thinking and ultimately improved knowledge retention (Webb & Mastergeorge, 2003). It can be transformational, as novel perspectives lead to new knowledge that change the learner's way of thinking (Hong et al., 2011). Benefits such as increased self-esteem and changes in perspective are likely results of relational learning, regardless of the context. Another potential outcome is an increased ability to learn in other situations. For example, in mentorship relationships, the mentees gain knowledge and skills from the mentors that they can later apply on their own, toward self-directed learning for example, as they develop independence and the ability and confidence to apply their learning to new contexts. One challenge of relational learning, however, is that some groups have been known to ineffectively share information among group members. Therefore, simply putting learners in a group does not guarantee effective collaboration (Kirschner et al., 2009).

2. Role of Technology

Technology plays an increasingly important role in mediating learning. The widespread development and use of telecommunication and information technologies in recent decades has changed how learning occurs across the continuum of formality. In particular, since the advent of the Internet and the proliferation of smartphones, technology has dramatically transformed the way learning occurs. Currently, several types of technologies commonly used to facilitate learning have had particular effects on informal learning. Many conceptualizations of technology-based learning have been explored, ranging from simply accessing an e-learning environment to reading, writing, and taking part in virtual dialogue in e-learning spaces (Hrastinski, 2008). Specific examples reviewed below include computer-based and online learning, generally discussed through the lens of formal learning. We also review MOOCs, gaming and simulations, and mobile learning, all of which typically fall within the informal portion of the learning continuum. Despite these distinctions, all technology-based learning has both formal and informal manifestations. In this section, we explore some of the major types of

technology that have fundamentally reshaped how and when people learn across the continuum of formality.

Computer-based and Mobile Learning

The use of computers as a learning tool is now ubiquitous. Computers can be used as an instructional tool in classroom-based settings (Kasworm & Londoner, 2000). In their literature review of computer-based learning, Moos and Azevedo (2009, p. 579) define computer-based learning as "any technology-based environment that was used as an instructional tool."As examples, the authors include databases, multimedia, and Web-based learning in the classroom or laboratory that supplement formal learning experiences. The use of computers to access information available on the Internet has fundamentally transformed the possibilities for learning—across the continuum of learning formality.

The recent proliferation of mobile technology has further expanded opportunities for learning. Mobile technology via small portable computers, usually a smartphone or tablet, has created new ways that learning can occur. Brown and Mbati (2015) find that an initial focus on cell phone learning has given way to more emphasis on the "mobility of the learner." These authors also emphasize connectivity, or the ability of learners to be "in network" even while they are on the move. Mobile learning ranges from very informal to formal. A student using a mobile device for formal learning might post to Twitter for an in-person college course or take an online course using a tablet at a public library. Informal use might take the form of an app-based game, a Google Chat with an expert on the other side of the world, or an Internet search from the street corner. Naismith and others (2004) note that approaches to record, organize, and retrieve the learning that occurs using mobile technology are needed. Whereas much learning may be occurring through mobile technologies, research has yet to determine its extent or depth.

Smartphone ownership is variable. Among the millennial generation, ownership is about 85 percent (Nielson, 2014). The proliferation of smartphones suggests that persons of all socioeconomic classes may have more opportunities for learning through this technology platform. However, although millennials have high rates of smartphone usage, earlier generations do not. As such, technologically advanced learning that produces greater equity may require different strategies for different age groups. Githens (2007) reviews some of the barriers to e-learning for older adults, including the stereotype that older adults are not technologically savvy and their actual lack of access to equipment. Despite the stereotypes about the lack of older adults online, Githens anticipates their increased participation in online learning.

Online Learning and MOOCs

Online learning typically refers to the use of technology that changes the delivery of education through a variety of online platforms (Berge & Huang, 2004; Means, Toyama, Murphy, Bakia &

Jones, 2009). Regardless of the platforms—whether discussion boards, chat rooms, or webcasting—online learning is thought to increase access to content by negating time or place (Means et al., 2009). A great deal of emphasis has been placed on online learning in the formal learning context by accredited universities or high schools where the use of online programs results in a change in the physical space of learning while all other conditions remain the same (iNACOL, 2011; National Education Association, n.d.; Quality Matters, 2014; Vai & Sosluski, 2011). Online learning is also a common mechanism for informal learning across the continuum.

Online learning may happen in a variety of ways, synchronously, asynchronously, or in a hybrid format. Synchronous online learning refers to learning that happens in real time, for example, posting to a chat room or to social media during a set period. Asynchronous online learning refers to learning in which one can engage at any time, for example, watching a lecture on video or posting a response to a practitioner blog according to one's own schedule. In the realm of formal learning, online educators increasingly advise the creation of learner clusters, frequently called forums, to encourage peer-to-peer dialogue asynchronously (Vai & Sosulski, 2011). Furthermore, online coursework may be offered as hybrid learning or blended learning experiences that are offered partially online and partially in the formal classroom (Arbaugh et al., 2009; Means et al., 2009). This type of learning is an increasingly common use of technology in formal, accredited education institutions.

Online learning experiences add a layer of anonymity that frees the learner to admit a lack of skills and seek knowledge (Milheim, 2007). In informal learning contexts, they might enable learners to seek information that they would not ask for in person due to embarrassment or fear. In the classroom, technology provides opportunities for teachers to tailor their instruction to meet the individual goals, needs, interests, and experience of each student (Vasquez & Serianna, 2012). In informal contexts, such as learning using MOOCs (discussed further below), learners tailor the content themselves when they select certain topics and presenters over others.

Flexibility is an important strength of online learning across the continuum of formality. Asynchronous online learning may be particularly effective because the learner has the freedom to access learning content at any time or location (Mayes, Ku, Akarasriworn, Luebeck, & Korkmaz, 2011). The flexibility of online learning can lead to greater control of learning by the learner, greater learner interaction with the content, and greater peer support and assessment (Booth, Carroll, Papaioannou, Sutton, & Wong, 2009). Support from peers far away and in different time zones would not be possible without online platforms and learners' increased ability to provide feedback on their own time.

Jacobs (2013) notes that online learning corresponds to Knowles' theory of andragogy—or adult learning—because that theory emphasizes the need for self-direction and self-motivation among adults. Online learning may be fully self-directed and learner led or mostly self-directed with instructor guidance. This model, which lacks a didactic teacher, seems to better motivate adults. Similarly, Mayes and her colleagues suggest that online learning seems to promote greater reflection and improved problem solving among adult learners (Mayes et al., 2011). In

this view, online learning does not just supplant face-to-face instruction. Rather, online learning offers new ways of interacting with the material and provides increased opportunity to engage in learning in informal ways given the greater availability of information.

The term MOOCs refers to the sharing of digital content (Liyanagunawardena, Adams, & Williams, 2013). Usually free, this type of online course is defined by unlimited open enrollment, the absence of prerequisites, and a lack of formal accreditation. Connectivity is usually provided through social networking, and a set of freely accessible online resources provides the study material content. Participation is voluntary and self-directed. Hew and Cheung (2014) find that many students are motivated by personal interest. However, their review of the challenges and advantages of MOOCs also notes that 90 percent of students drop out before completing such courses. They suggest that a lack of understanding and incentive are the probable causes (Hew & Cheung, 2014). From the lens of self-directed adult learning, many may stop looking for information when they feel their goal has been achieved, so it is possible this may not be a problem. The ability to stop and start is an advantage of self-directed learning that is further supported by the flexibility and easy access of online platforms.

Gaming and Simulations

The use of games and other simulations to promote learning is another way that technology is increasingly used. Games may prove to be a particularly powerful tool because of the often high degree of motivation among learners to engage in gaming along with the potential of gaming to provide opportunities for experiential learning (Kirriemuir & McFarlane, 2004). In their research review, Boyle and colleagues (2014) examine the use of traditional games, serious games (intentionally designed to support learning), animations and simulations, other general e-learning applications, web-based learning tools, and other modeling tools and found mixed results on learning outcomes. They note that the use of games recognizes the increasing need for technologically advanced citizens.

In the same way, simulations can help learners understand a concept before applying their knowledge in the real world. Virtual reality simulations can help students and entry-level workers gain specific skills needed at work (Stone, Watts, & Zhong, 2011). Such a training approach has also been used widely within the military(Morrison & Hammon, 2000; Psotka, 1995).Workplaces might expand their training to include the use of simulations to boost their employees' informal skill set before they actually begin working.

Technology and Workplace Learning

The use of technology for learning at work, particularly how it changes corporate culture, is an important area of practitioner interest. Large businesses frequently have set up their own intranet to encourage collaboration and information sharing (Bansler, Damsgaard, Scheepers, Havn, & Thommesen, 2000). Intranets are private Internets that are "multi-purpose, richly networked, and . . . integrate text, graphics, sound, and video" (Bansler et al., 2000, p. 3). Several

other uses of technology in the workplace include learning portals; online, company-specific information pages; technology-based simulations; and virtual worlds(CEB Learning and Development Leadership Council, 2014).

Equity Issues with Technology

Despite its potential to increase learning opportunities, technology is not equally accessible. Basic Internet access is often determined by socioeconomic status, (Gorard, Selwyn, & Williams, 2000; U.S. Department of Commerce, 2011), although the introduction of smartphones has helped make the Internet more accessible to many more lower-income Americans. Broadband speed and access remain stratified by the wealth of the county of residence(Gordo, 2015). Whether the learner can use the technology effectively to learn is another challenge. The Aspen Institute asserts that not all learners can use the available technology and may need additional assistance to develop such literacies (2014). Wojciechowski and Palmer also find that adults with greater academic skills are more likely to be successful in online learning (2005). Formal and informal online learning opportunities might not be fully used by all learners, especially those who lack technical savvy and struggle with reading comprehension (Kelland, 2005; Organization for Economic Co-operation and Development, 2010). The Organization for Economic Co-operation and Development's (OECD) New Millennium Learners project finds that the "new digital divide" is not between those who have computers and those who do not, but between students who know how to use computers to their advantage and everyone else. Attrition is another significant problem for at-risk students, including both those who drop out entirely and those who stop and start (Layne, Boston, & Ice, 2013). Still, online learning may promote access among those who do not have access to many learning opportunities. For example, underserved rural students can benefit greatly from access to online platforms (Vasquez & Serianna, 2012).

C. Who Benefits from Informal Learning?

Like formal learning, informal learning may not benefit people equally. Given the increasing importance of lifelong learning and thus the ability to engage in informal learning, we discuss the implications for access and equity in terms of who benefits from informal learning. In this section, we examine this issue in two ways. First we examine the ways that informal learning can vary in how it helps different types of learners. We then examine the tension between the benefits of informal learning to individual learners and to organizations.

1. Variation across Individuals

Who benefits from informal learning—both organized informal learning and everyday informal learning—depends on the individual. In their review of the literature related to workplace training, for example, Salas and Cannon-Bowers(2001)conclude that training is affected by several factors pertaining to what skills and capacity workers bring to the training, including their cognitive ability, self-efficacy, and goal orientation. They also discuss what enables

workers to learn and participate in training. The learners' confidence and the level of challenge are also important factors in workplace learning (Eraut, 2007). Based on the self-directed learning literature, Boyer et al.(2014)identify a variety of individual factors that predict the success of self-directed learning, such as internal locus of control, motivation, performance, and self-efficacy. Several factors, however, relate to the likelihood that workers will pursue informal learning opportunities, including the degree of self-directedness in their own career processes, the potential financial rewards from the learning, and its relationship to job retention (White, 2012). Furthermore, some workers are more likely to be disadvantaged in their access to informal learning opportunities and are, therefore, less likely to benefit.

Hansson (2008) also notes that workplace training is not equally distributed among employees. Older, low-skilled workers, and to some extent, female workers, often receive less training than other groups do. Inequalities do not always arise because of differences in returns to training but may also be a consequence of unequal distribution of training investments. Employers have little monetary incentive to fix this inequality. Moreover, organizations tend to provide organized informal learning opportunities for educated, younger, and permanent staff over casual staff (Misko, 2008). Low-wage workers also are less likely to receive workplace training than more advantaged workers are. From a rare set of case studies of firms across five states, Bassi (1994) finds little investment made in training hourly workers. Such a lack of training results in their lower lifetime learning and fewer opportunities for informal learning and personal advancement. Similarly, adults with disabilities may not have access to informal, on-the-job learning opportunities such as employee training or mentoring programs that could help promote their early career development and lags in future employment (Lindstrom, Khan, & Lindsey, 2012).

Learners with the greatest advantage—that is, those with strong foundational skills—are more likely to pursue more education. Thus, their early positive experiences with education lead to more education (White, 2012). The motivation to seek formal education in the workplace is based on workers' baseline education (Kyndt, Dochy, Onghena, & Baert, 2012). Beyond the ability to participate in organized workplace learning opportunities, workers' work capacity or ability to independently problem solve, is also a critical aspect of informal learning because it determines the length of time they can independently learn (Marsick & Watkins, 1990). Murad and his colleagues find that advanced learners derive more benefits from independent learning, whereas less advanced learners may not gain as much new knowledge and/or may need guidance from a mentor when they engage in informal learning.

Furthermore, learners' expected value and goals of learning are essential to their motivation to learn. Much of the research on the individual factors related to adult learning focuses on expectancy value theory, which emphasizes the expected return from doing a task (O'Neill & Thomson, 2013). Although interest in the task is important, the researchers assumed that adults—more than children—ultimately seek a specific outcome from learning. As such, the biggest learning motivator is a desired result, such as learning a trade. Importantly, within this paradigm, self-efficacy beliefs cannot be fully separated from the expected value. If an adult

does not believe that he or she can do something well enough to obtain a desired outcome, he or she may stay away from the learning opportunity altogether as a result of a rational, albeit pessimistic, cost-benefit analysis. However, high-pressure environments, such as family survival or a career promotion, can motivate adults to increase their effort to learn because the value of achieving a goal is significant (O'Neill & Thomson, 2013). Goal theory is related to adult learners' individualized, independent desires to achieve certain outcomes. Clearly defined goals lead to greater success when adequate personal or financial resources are available. Additionally, low-skilled adults are often apprehensive about returning to school or training and may experience high anxiety that limits their creation of learning goals (O'Neill & Thomson, 2013).

Learning for the sake of acquiring new knowledge is also a motivator for informal learning. However, although more advantaged skilled workers may choose to learn for fun, many lower-skilled adults are motivated to pursue learning for its potential economic returns. In fact, the adult learning literature underscores the changing economy and job instability as primary drivers for learning among adults at all education levels. O'Neill and Thomson(2013) point out that many adults pursue learning to attain a credential needed to maintain their employment. For example, when adults return to school to earn a GED, their interest is not in the subject material per se, but rather, in attaining the credential.

A lack of self-efficacy can be a barrier for informal learning among adults (Salas& Cannon-Bowers, 2001). This is a serious equity issue for low-skilled adults, who may have grown up in disadvantaged school environments and/or have experienced unsuccessful learning in the past and who have internalized the belief that they cannot be successful in traditional classrooms (Schwartz, 2015). The use of counter spaces, or places that look different from formal learning environments like the typical classroom, might help these adults overcome some of the negativity they associate with learning (Schwartz, 2015).

2. Organizational versus Individual Goals

Although informal learning can serve the goals of both individuals and organizations, sometimes tension is noted between them. The research on workplace learning reveals the tension between increasing employee productivity for the company's benefit and supporting the growth and development of workers. According to Livingstone (1999b), lifelong learning may be understood through a political lens that elucidates whose goals it serves and puts a priority on. At one extreme, learning may serve the goals of employers; much of the literature on learning organizations highlights this perspective. The need to train and retrain workers to make them competitive is partially the rhetoric that focuses on employer needs rather than on employee learning and growth. Livingstone (1999b) questions the need for widespread lifelong learning, cautioning that only targeted training with actual value to current employees is worthwhile. Similarly, Harris (2000) questions whether new skills are required or even that workers lack these skills and posits that employers must maintain control over the scope and content of work-related education.

The research on learning organizations explores the idea that organizations can promote learning among their workers to lead to improved effectiveness and better use of human potential (Senge, 1990; Watkins & Marsick, 1993). Through such a framework, the goals of the individual and the organization share a kind of "mutuality." Informal learning supports not only the goals of the individual but also the goals of the organization and fosters the individual's desire to help achieve those goals (Marsick & Watkins, 1990).

Critics contend that the predominant interest in organizational and workplace learning in the early 21st century is heavily aligned with a managerial agenda in pursuit of technological and economic imperatives (Casey, 2013). They argue that these priorities can partially explain the deterioration in employment relations and in the quality of work and workers' lives in many developed and developing countries. Since the 1980s, the interest in the concept of lifelong learning and the increased need to promote ongoing learning has been linked to changes in the labor market that require the constant retraining of employees (Glowacki-Dudka & Helvie-Mason, 2004; Pells, Steel, & Cox, 2004). Simultaneously, others have criticized the promotion of employer over worker needs (Casey, 2013; Glowacki-Dudka & Helvie-Mason, 2004; Harris, 2000; Livingstone, 1999b) coupled with the imposition of responsibility for ongoing skill building on workers while employers retract their support of training and development (Livingstone, 1999b).

In contrast, learning can be designed to help oppressed groups make social change through transformative learning. Broadly defined, transformative learning refers to the process by which people alter the frames of reference they take for granted—in other words, their perspectives, habits, and mindsets—to become more inclusive, open, emotionally capable of change, and reflective (Bridwell, 2013; Mezirow, 1991). Freire's (1970) work on critical pedagogy provides a foundation for transformative learning to foster awareness of social injustice and oppression. Transformational learning can help disadvantaged learners escape marginalization through a full understanding of power and social location (Bridwell, 2013). To this end, transformative learning can foster critical thinking, which is valuable to learners as citizens and as workers.

Furthermore, Casey (2013) makes the case that the post-Great Recession economy calls for greater awareness of different ways to approach learning organizations and to promote worker education. He advocates engaging with workers as equal participants rather than selectively training them for utilitarian purposes. Further, this approach recognizes other experiences and aspirations of workers—their "human interests." Thus, refocusing on employee benefits might help maximize the potential of workplaces as sites of lifelong learning or learning organizations. But such an approach requires trust building in the workplace and greater engagement with unions. Informal learning can have a role in fostering social movements, thereby moving critically beyond both the learning organizations and the workplace too. If the critical content of informal learning, as promoted through learning organizations in the workplace, was to be examined more deeply, workers might question the status quo of their organization (Overwien, 2000). Nevertheless, a greater focus on individual learning and outcomes other than simple

productivity, such as becoming better citizens or developing personal potential, should be considered to ensure that informal learning benefits individuals as much as it promotes organizational goals (Casey, 2013; Fleet et al., 2008).

II. SPECIFIC TYPES OF INFORMAL LEARNING

Informal learning encompasses a vast array of different types of learning. In this section, we discuss each of the specific types of informal learning, including those that fall under organized informal learning and everyday informal learning, primarily in the workplace. Table 2 illustrates the diverse types of learning that occur across the continuum of learning formality. We explore how these specific types of learning are defined and the activities they encompass. We highlight the strengths and weaknesses of each type of learning, practices that promote these types of learning, and the implications for equity and access to learning among disadvantaged learners.

Table 2. Specific Types of Learning across the Continuum of Learning Formality

Formal learning	Organized informal learning	Everyday Informal learning		
		Self-directed learning	Incidental learning	Tacit learning
Traditional degree programs Competency-based education Work-based learning Volunteerism and service learning	Noncredit learning Work-based learning Volunteerism and service learning Communities of practice Mentoring, Coaching	Trial & error, learning by doing Modeling others Reading, Web searching	Trial & error, learning by doing Modeling others Reading, Web searching	Trial & error, learning by doing Modeling others Occupational socialization

In this section, we do not provide detail on specific types of formal learning. However, when types of formal learning overlap with organized informal learning, we discuss these in the context of informal learning, acknowledging that these also can occur in the context of formal learning.

A. Organized Informal Learning

Multiple types of learning activities comprise organized informal learning. These activities are composed of experiences in which learning occurs through a variety of ways of learning, including curriculum-based learning and experiential and relational learning. Noncredit learning is primarily done through curriculum-based learning. Work-based learning and service learning are distinct in the continuum of learning in that both are based in learning through doing—that is, experiential learning. At the same time, these all are intentionally organized within an institutional context—whether through school, work, or the community. Finally, activities including mentoring/coaching and communities of practice are primarily based in relational learning that occurs in the workplace. Many of these activities can occur as part of everyday learning, but in this section, we focus on those that occur in institutional settings—in school, work, or community—with a degree of organization and structure. In the following section, we discuss each of these specific types of learning in more detail.

1. Noncredit Learning

Noncredit learning takes place in a traditional schoolroom setting, but no academic credit is given upon the completion of the coursework. Much of this learning is work related, and the goal is to start or advance one's career or technical knowledge base. The most frequently reviewed forms of noncredit learning are courses in noncredit programs offered by schools, often community and technical colleges (D'Amico, Morgan, Robertson, & Houchins, 2014; Milam, 2005; Van Noy, Jacobs, Korey, Bailey, & Hughes, 2008), and classes offered by employers on or off site for their employees (Hann, 2012; Sambrook, 2005). In this section, we primarily focus on noncredit learning that serves workplace goals, although additional learning occurs that is related to learners' other vocational goals.

Noncredit learning is distinctive because, while informal, it lies closer to the formal end of the continuum of learning than do other types of learning. In fact, some confusion exists regarding the formal nature of this type of learning. Though this type of learning does not result in an individual's accruing credits or a general diploma, learners may be given a certificate of completion, one that does not count toward an academic credential. In contrast, other types of noncredit courses created by community colleges for general enrollment may follow a specific set of externally determined guidelines and may sometimes result in a recognizable credential that increases the learner's employment prospects within a certain field (Arena, 2013; Van Noy et al., 2008). Such recognition moves the experience to the formal end of the continuum of learning, where learning results in a widely recognizable and accredited credential from a course containing a peer-reviewed curriculum. A noncredit curriculum created entirely by an employer for the purpose of continuing education for its employees is unlikely to meet all these criteria, especially the requirement for outside peer review of course material.

Opportunities and Challenges of Noncredit Learning

Several trade-offs exist with some noncredit programs offered by colleges. Many community colleges report the greater flexibility of noncredit programs to align with changing labor market needs than is possible with formal credit programs. Noncredit programs are less burdened by long-established curricula and can therefore be at the center of innovation (Van Noy et al., 2008). However, these programs do not offer academic credentials that would enhance employment opportunities for the student and are essential for the pursuit of additional formal education. A lack of specific outcomes (credentials) and/or awards can minimize the benefits of a training program and make it less desirable (Glowacki-Dudka & Helvie-Mason, 2004), so noncredit programs attempt to formalize to remain competitive and to assert their value to employers and prospective students. However, this formalization can take the form of non-academic credentials, similar to certificates of completion offered by colleges. Table 3 summarizes the opportunities and challenges associated with noncredit learning.

Table 3. Opportunities and Challenges of Noncredit Learning

Opportunities	*Challenges*
-Flexibility in curriculum -Opportunity for lifelong learning -Low-pressure opportunity to explore education	-Lack of credential -Uneven opportunity

Noncredit programs offered by colleges may provide a non-threatening way for disadvantaged populations to explore education. More formalized programs may be intimidating to those who have had negative experiences with credentialed learning previously(O'Neill & Thomson, 2013). Instead, community college noncredit courses may afford disadvantaged learners an opportunity to experience classroom-based learning in a college setting without the typical academic pressures(Grubb, Badway, & Bell, 2003). Compared with formal credit education, noncredit programs are more flexible, require less time to complete, and are offered at hours that accommodate a full-time work schedule. However, these programs often do not offer financial support that is available for accredited programs (Davies, 1999; Van Noy et al., 2008).

In addition to noncredit programs offered by colleges, employers sometimes offer classroom-based learning opportunities for their workers. Employer-sponsored education and training can occur in the form of seminars, workshops, classes, and lectures (Hann & Caputo, 2012). Many are planned learning initiatives provided by the employer to improve performance (Le Clus, 2011). Jacobs and Park (2009) describe formal training offered by employers as a critical element of workplace learning in addition to more informal learning on the job. In this type of training, the learning is planned and separated from everyday job activities (Manuti et al., 2015).Smaller companies are less likely to provide this type of learning because of their reduced capacity and resources to offer organized classroom learning or to pay their employees to attend courses at other locations (Pells et al., 2004). Larger companies sometimes have corporate universities that offer such learning opportunities.

2. Work-Based Learning

While workplace learning is broadly defined as all learning that occurs "on the job," work-based learning is formally organized and supervised through schools, where the workplace is deliberately used as a site for learning (Bragg, Hamm, & Trinkle, 1995). Because the workplace, rather than the classroom, is the site where learning occurs, the dominant mode of learning is informal and holistic (Brodie & Irving, 2007). In other words, students participating in work-based learning "learn by working," acquiring much more than just the technical skills necessary to perform a job. Furthermore, work-based learning is characterized as customizable to both the student and the organization where the student works (Chisholm, Harris, Northwood, & Johrendt, 2009). Work-based learning is also described as situated and self-directed (Raelin, 2008). Learning is not highly conscious but instead is haphazard, inductive, and action oriented (Onstenk & Blokhuis, 2007). As with other forms of learning, reflection is necessary for the process of learning (Ryan, Toohey, & Hughes, 1996). Moreover, work-based learning is influenced by the norms, structures, values, and practices embedded in the work setting (Onstenk & Blokhuis, 2007) and is project and/or problem focused (Alfeld, Charner, Johnson, & Watts, 2013). Finally, learning occurs in relation to communities of practice through mentoring (Sheehan, Wilkinson, & Bowie, 2012), a topic discussed later.

A primary purpose of work-based learning is job training aimed at developing pre-employment skills (Lerman, Eyster, & Chambers, 2009; U.S. Congress, 1995). Work-based learning also serves to build stronger partnerships between schools and employers and contributes to the economic well-being of the United States (Bragg & Hamm, 1996). Beyond enhancing technical and academic skills, work-based learning assists the learner in developing metacognitive skills (Brodie & Irving, 2007; Raelin, 2008)and enhances socio-emotional and career development (Alfeld et al., 2013) by linking theory to practice and allowing students to test their commitment to different careers (Ryan et al., 1996).

Broadly speaking, there are a multitude of ways for students to participate in work-based learning experiences, although students participate at lower rates in the United States than in all/most other industrialized nations (Hoffman, 2011). Although no nationally representative data are available for enrollment in all types of work-based learning experiences, the existing statistics show that about 75 percent of high school seniors participate in some kind of brief worksite observations (Alfeld et al., 2013; Haimson & Bellotti, 2001). Work-based learning experiences are popular in certain fields, including business, human services, and engineering, whereas nursing is the only field to uniformly require work-based learning as part of the curriculum (Bragg et al., 1995).

There are many different types of work-based learning opportunities. Table 4 shows some of the more common forms of work-based learning experiences organized by the level of intensity based on the level of formality—that is, whether the experience has the possibility of yielding academic credit. Later in this section, we discuss each of these types in depth.

Table 4. Summary of Work-Based Learning (WBL) Experiences

	WBL Experience	Option for Academic Credit	Option to be Paid	Career Exploration	Skill Development
Most Intensive	Apprenticeship	X	X		X
	Clinical	X			X
	Internship	X	X	X	X
	Cooperative Education	X	X	X	X
To Least Intensive	School-based Enterprises			X	X
	Job Shadowing			X	
	Career Academies			X	
	Worksite Tours			X	

Though not exhaustive, this list of work-based learning experiences covers the types of experiences most discussed in the literature. Importantly, although no single experience exhibits all of the dimensions outlined, many of these work-based learning opportunities promote career exploration and/or the development of professional skills.

A robust amount of evidence suggests that students learn better when participating in work-based learning experiences than when working a summer job or one found by the student him or herself (U.S. Congress, 1995). At the same time, more evidence shows that work-based learning is significantly divorced from school-based learning (Onstenk & Blokhuis, 2007).Thus, the student is challenged to navigate between the curriculum (i.e., theory) and the knowledge learned at work (i.e., practice). Research shows that when students have greater control over the tasks they perform and when the tasks are complex, learning is increased. Moreover, learning is increased when the students are evaluated, receive feedback, and are able to reflect on what they have learned (Ellström, 2001). Overall, work-based learning experiences allow students to apply knowledge and skills, develop competencies, evaluate their progress, and identify needs for further personal and professional development (Ryan et al., 1996).

Both schools and employers should consider several practices that have been identified to enhance learning through work-based learning experiences. Few schools promote the integration of school-based and work-based learning(Bragg & Hamm, 1996). Employers should give students a broad introduction to their company or organization, provide opportunities for students to exercise both autonomy and teamwork, assign them problems to solve, explore, innovate, and afford opportunities to assume some supervisory functions and to participate in trade/union events (U.S. Congress, 1995).

Although a wide range of work-based learning experiences exist, access can be problematic because opportunities are limited (Alfeld et al., 2013). For those who can take advantage of existing opportunities, one study shows that minority students entered college at twice the rate

of students who did not participate, suggesting that work-based learning may serve as a mechanism to improve educational equity (Rogers-Chapman & Darling-Hammond, 2013).

Work-based learning can be instrumental in helping students identify their strengths and career pathways for building new skills and relationships and for expanding professional networks (NYC Department of Education, n.d.). Participation in work-based learning is also associated with a small positive effect on GPA, attendance in school, lower dropout rates, higher graduation rates, and postsecondary enrollment, with mixed results regarding students' employment, mobility, and earnings (Rogers-Chapman & Darling-Hammond, 2013; U.S. Congress, 1995).

How Work-Based Learning Occurs

With most scholarly attention focused on student outcomes and program evaluation of formal education, how informal learning occurs through work-based experience is still opaque. Attempting to shed light on the learning process, many scholars employ Lave and Wegner's (1991) situated learning theory, in which learning is viewed as contextually dependent as individuals learn through the act of participation in communities of practice. In this sense, learning is both relational and experiential, and knowledge is understood as being always situational. Moreover, knowledge acquisition is mediated by the knowledge that the learner already possesses, interactions with employees of the organization, and the culture of the organization, including its values, norms, and practices. Therefore, learning is considered integral and inseparable from social practice. The learner is deemed an expert once he or she is a full participant.

Raelin's (1997) model for work-based learning focuses on the interplay between explicit and tacit knowledge and theoretical and applied learning at both the individual and collective levels. Accordingly, work-based learning is more than experiential learning because it requires the learner to reflect on his or her experience to learn. He argues that learners must be proficient in bridging the gap between explicit and tacit knowledge and theory and practice. At the individual level, Raelin's idea extends Kolb and Fry's (1975) learning cycle model, where conceptualization allows the learner to challenge the assumptions underlying his or her practice. From conceptualization follows experimentation that grounds and contextualizes the learner's knowledge. Experience reinforces tacit knowledge gained through experimentation, and reflection makes the learner aware of the tacit knowledge gained through experience and contributes to reconstructing meaning (which completes the cycle and returns the learning to the process of conceptualization). Raelin's contribution lies in his discussion of how learning occurs collectively. At this level, conceptualization informs inquiry through the scientific methods used in applied science. On a daily basis, practitioners do not engage in applied science but incorporate the approaches of applied science into practice. This transformation of knowledge into practice is referred to as action learning (i.e., real-time experience, especially in solving problems). The act of coming together in action constitutes a community of practice in which practitioners construct shared meaning and problem solve.

Because learning occurs through different modes (e.g., experience, social interaction, and reflection), effective work-based learning will incorporate multiple modes of learning. In addition to the contextually dependent knowledge acquired through work-based learning, much of the scholarship on this topic teases out the skills that are developed and refined through these experiences. Broadly, skills can be categorized as technical skills(mastering procedures, understanding fundamental principles, building analytical judgment), generic workplace skills (teamwork, problem solving, communication, etc.), and social/personal skills (positive work attitude, motivation, initiative, etc.) (Bailey, Hughes, & Moore, 2004). This paper focuses on workplace skill development as it relates to specific forms of work-based learning experiences (such as apprenticeships and internships).

Perhaps the greatest advantage associated with work-based learning is the rich context in which learning occurs. When compared with traditional school-based learning characterized by abstract and decentralized knowledge acquisition, some view the applied nature of work-based learning as a more effective pedagogy (Bragg & Hamm, 1996). Additional advantages include greater engagement in learning both formally and informally, structured guidance—including feedback and reflection—and continual learning.

The School-to-Work Transition

Work-based learning gained considerable attention in 1994 when the U.S. Congress passed the School-to-Work Opportunities Act to assist youths and young adults in the transition to work, particularly those who were not college bound. Calling for educational reform that strengthened the relationships between (1) vocational and academic education, (2) educators and employers (i.e., school and work), and (3) secondary and postsecondary education (Bragg & Hamm, 1996), the act attempted to adapt instruction to the ways in which students learn and to improve the economy by providing better training for new workforce participants. Recognizing that transitioning from being a student to a worker is not a single event (Lewis, Stone III, Shipley, & Madzar, 1998), clinical and cooperative education became the dominant school-to-career program at the postsecondary level.

A national longitudinal study of school-to-career programs undertaken to evaluate the School-to-Work Opportunities Act shows some success in achieving its objectives, including higher post-high school employment rates for students who participated in co-ops, internships, and apprenticeships (Neumark, 2006). Students enrolled in school-based enterprises continued with formal education more than those who did not participate in these. Importantly however, overall, disadvantaged students did not benefit from these programs, although some evidence suggests that internships and apprenticeships may be advantageous in boosting employment for Blacks.

Even with the relative gains made through the School-to-Work Opportunities Act, challenges to the school-to-work transition remain evident. Such programs require students to commit to a

career early in life, at a time where their labor market participation is still volatile. Moreover, many employers do not think it is their responsibility to train their workforce, relying instead on formal education, even though many workforce skills cannot be learned in the classroom (Alfeld et al., 2013).

Types of Work-Based Learning Experiences

Several types of work-based learning provide intensive experiences such as apprenticeships, clinicals, cooperative education, and internships. Although each can be structured with varying degrees of intensity, all provide learners with the opportunity for career preparation.

Apprenticeships: An apprenticeship is formalized paid worker training in which a novice employee acquires knowledge through a hierarchical relationship with a master (Carlson, May, Loertscher, & Cobia, 2003; Lancy, 2012; Steinberg & Gurwitz, 2014). This formalized training is supplemented by classroom instruction leading to a certification of industry-recognized skills. Historically, until the 1970s, apprenticeship was strongly associated with the skilled trades, particularly construction. Learning occurs through practice and imitation and tacitly through interactions with the master (Nielsen, 2006). By the time apprentices have completed their training, their ability to learn and awareness of what learning requires has grown substantially (Lerman et al., 2009). Despite the benefits of apprenticeships, apprentices make up only 0.2 percent of the workforce (Lerman, 2014). Currently, there are approximately 375,000 registered apprenticeships, a number that has dropped by one-third from 2007–2013 (Schwartz, 2015). However, registered apprenticeships exist in a wide range of fields and occupations such as healthcare with medical assistants and phlebotomists, manufacturing with megatronics technicians, technical product designers, and IT technicians (Steinberg & Gurwitz, 2014). Although youth apprenticeships can start as early as 15 years old, the average age for apprentices is between 25 and 27 yearsold (Alfeld et al., 2013). Apprenticeships for older workers are a relatively new phenomenon (Fuller & Unwin, 2012).

The heterogeneity among apprenticeship fields makes it more difficult to identify crosscutting best practices. However, the master's transparency when teaching (Nielsen, 2006), sustained organizational commitment (Fuller & Unwin, 2007), industry-recognized credentialing (Steinberg & Gurwitz, 2014), and the development of company on-the-job training plans (Business Roundtable, 2014) have been suggested as critical for promoting learning in apprenticeships.

A number of positive outcomes emerge as a result of completing an apprenticeship, including higher wages (Lerman, 2014) and employment rates (Neumark & Rothstein, 2006). In terms of learning, research shows that apprenticeships enhance higher-order thinking (Carlson et al., 2003), increased confidence, and independence for the learner (Harris, Simons, Willis, & Carden, 2003). Apprenticeships also enable learners to visualize what they do on-site when in the classroom, linking the theoretical and abstract ideas taught in school to the contextualized

knowledge gained through the work experience. Over time, knowledge becomes automatic (Harris et al., 2003).

Clinical: Clinical experience is common in medical fields and involves unpaid worksite experience. Little research related to informal learning and clinical experience exists, but some evidence indicates that informal learning focuses mainly on professionalism (Balmer, Ruzek, Ludwig, & Giardino, 2007).

Cooperative Education: Cooperative education (co-ops), is the oldest and most widely used informal learning experience in the United States(U.S. Congress, 1995). Broadly defined as anything with some form of experiential or work-based learning (Zegwaard & Coll, 2011), co-ops are composed of school learning (i.e., receiving course credit) with work experience related to the student's career goals where the student is considered an employee (Kessels & Kwakman, 2007; Lewis et al., 1998). While in practice, apprenticeships, internships, and co-ops can look very similar, students usually are not enrolled in school when participating in a co-op.

Given that students will rotate (often by semester) between work and school, the sequencing of knowledge is a major challenge when implementing co-ops. In the classroom, knowledge progresses rationally, but on the job, procedures take priority. Students will be exposed to new knowledge regardless of their prior classroom experience, but in the workplace, new knowledge is generally only shared when it is necessary to complete certain tasks, so the student must rely on prior knowledge (Munby, Taylor, Chin, & Hutchinson, 2007). A further division between the classroom and workplace learning is the fact that technology often allows scientific knowledge to be bypassed. For instance, theories about information networks may have been presented in the classroom, but at work, a student will instead learn a software program that allows him or her to troubleshoot and resolve network issues. In this example, one does not need to know the theories of information networks as long as he or she is adept at using the software.

To combat these challenges, best practices for organizations include detailing the skills expected to be learned, adhering to training agreements, and implementing a solid coaching system (Lewis et al., 1998). Schools should engage in periodic worksite supervision (Lewis et al., 1998), and in partnership with employers, learning institutions should carefully select and design student activities with appropriate assessment tools of learning outcomes (Kessels & Kwakman, 2007). To foster career clarification, the learner needs to spend a significant amount of time in the workplace alongside a practicing expert to allow for enculturation into the community of practice (Zegwaard & Coll, 2011).

In addition to improved career decision-making, some evidence reveals that students who participate in co-ops exhibit better problem-solving skills(Linn, Howard, & Miller, 2004) and increased confidence in their ability to work (Zegwaard & Coll, 2011). Co-op students seem to benefit as well from higher employment rates and salaries (Neumark & Rothstein, 2006; Zegwaard & Coll, 2011).

Internship: Often conflated with cooperative education, an internship is often defined as a term-length placement with an organization, accompanied by both faculty and company supervisors, and a course in which they receive academic credit (Narayanan, Olk, & Fukami, 2010). Compared to the 15 percent of companies that propose co-ops, about 60 percent of companies surveyed offer internships. Obviously, social differences are generated between those who participate in paid and unpaid internships. Based on national data from the late 1990s, high-achieving and college-bound students participate in unpaid internships at higher rates, whereas women, African American, and non-college-bound students more often participate in paid internships (Haimson & Bellotti, 2001).

Learning through internships begins as soon as the student begins the experience and centers on roles, informal rules, developing an understanding of professionalism, and the culture of the workplace(Toumen, Leroux, & Beney, 2012). Students also learn the importance of communication and teamwork along with how to build relationships (Barnett, 2012). The internship experience can be enhanced through the incorporation of several practices, including distinguishing between learning and career goals and providing students to achieve both (O'Neil & Marsick, 2009). Best practices for schools include crafting academic assignments that ask students to reflect on their work experience, such as daily journaling (Clark, 2003).

Students often report high levels of satisfaction with their internship experience, even when they do not report learning a great deal on the job (Hergert, 2009). They also report improving their skills in communication, writing, problem solving, and critical thinking along with their ability to place abstract concepts into context; they also see greater self-efficacy and increased ambition as positive outcomes of the internship experience (Narayanan et al., 2010). Learners with internship experience have higher employment rates and greater job stability and make an easier transition from school to work (Hergert, 2009; Neumark & Rothstein, 2006).

Less Intensive Work-Based Learning Experiences: Little research on other, less intensive work-based learning experiences is available. School-based enterprises (i.e., school-owned enterprises operated by students), job shadowing, and career academies (i.e., "small, career-oriented 'schools within schools' that integrate academics, career exploration, occupational preparation, and sometimes work experience") fall into this end of the continuum. School-based enterprises are critiqued for not being real-world experience (Alfeld et al., 2013)nor being useful for clarifying career goals (Haimson & Bellotti, 2001), but they are positively associated with continuing formal schooling (Neumark & Rothstein, 2006). A benefit of job shadowing is that students are socialized into a profession, thus enhancing student learning and assisting students' development of career goals (Paskiewicz, 2002). Finally, career academies primarily serve disadvantaged populations, providing work-based learning opportunities to those who otherwise may not have access.

In summary, work-based learning is multidimensional, providing learning opportunities not only to acquire and use new knowledge but also to develop skills, socio-emotional cognitions,

and a better understanding of workplace culture. Some argue that the type of learning that occurs through such work-based opportunities cannot occur through other methods. Under optimal conditions (like those identified above as best practices), work-based learning is reinforced and enhanced by classroom learning and serves to benefit schools, employers, and students alike. However, the onus of learning falls squarely on the learner, who must make sense of and reconcile the disparate knowledge presented in the classroom and on the job.

Opportunities and Challenges of Work-Based Learning

Several opportunities and challenges exist across the various types of work-based learning, as summarized in Table 5. Among the types of work-based learning, apprenticeships offer some specific opportunities and pose challenges due to cost and formal rules and structures. Of the potential learning benefits related to apprenticeship, socialization into the profession has received the most scholarly attention (Lerman et al., 2009; Parker, 2006). Socialization is linked to forming a professional identity, an additional benefit of apprenticeship that extends to other forms of work-based learning, including internships (Chan, 2013; Lerman et al., 2009). For instance, not only does a plumber's apprentice learn the skills necessary to perform plumbing work, but he or she also develops an identity as a plumber through the experience of transitioning from novice to master. A final benefit of apprenticeships is that they are flexible and customizable, characteristics that may be particularly appealing to adult learners (Business Roundtable, 2014). In contrast, this flexibility and customization does not translate into transferability; thus, a major disadvantage of apprenticeship programs is that they lack interstate portability (Steinberg, 2014). Furthermore, one reason that certifications are not nationally recognized is that the quality of these training programs is not standardized (Steinberg & Gurwitz, 2014). Although some streamlined processes allow apprentices to move quickly through recertification/licensure, the lack of standardization has produced a wide range of expertise.

Like apprenticeships, co-ops also have some distinct opportunities and challenges. Some evidence reveals that co-op participants learn more on the job than their non-participating counterparts do(Bragg & Hamm, 1996). One of the major benefits of the co-op experience is that continual and contextualized learning occurs (Linn et al., 2004). In addition, scholars argue that co-ops provide participants with career clarification—also a benefit of internships (Zegwaard & Coll, 2011). Although people who participate in co-ops acquire a clearer understanding of the types of careers available, challenges to learning include potential idle time at work and the lack of clarity of assignments(Linn et al., 2004). Another disadvantage is that the language used in the workplace does not often align with the concepts taught in school (Zegwaard & Coll, 2011), forcing the students to become translators (not necessarily negative, in my opinion).

Internships afford opportunities and challenges similar to those of apprenticeships and co-ops. Internships can be designed to serve different purposes for different learners and provide opportunities to build professional experience and clarify participants' career values (Haimson & Bellotti, 2001; O'Neil & Marsick, 2009). One study shows that a further benefit of an

internship is that the learner develops more realistic expectations of the workplace, understanding what it means to be a worker in that particular environment (Barnett, 2012). A major challenge posed by internships alone is whether remuneration is offered. Questions about the legality and ethics of unpaid internships pervade the literature (Bernhard, 2015; Tepper & Holt, 2015). Another challenge to learning through internships is that research shows that school outcomes, such as GPA, are negatively affected.

Table 5. Opportunities and Challenges of Work-Based Learning Experiences

Opportunities	*Challenges*
-Socialization into the profession -Build professional experience and career clarification -Continuous and contextualized learning	-Quality of training may vary -Learning in the workplace might not be aligned with school curricula -Administrative and cost barriers to establishing -Unequal access

3. Volunteerism and Service Learning

Another prominent form of organized experiential learning is learning that occurs when an individual volunteers in a community as part of a formal learning experience, often referred to as service learning. One type of experiential learning, service learning, is unique due to its focus on civic engagement and learning. Rooted in Dewey's (1902) idea of "progressive education" where action and thought occur both in and outside the classroom, today's service learning programs arose from a tradition of national service and student activism of the 1960s (Mooney & Edwards, 2001). Coined in the 1970s, the term service learning encompasses a broad range of activities and definitions. Simply put, it means that students volunteer in a community in return for academic credit, a definition that fails to capture important distinctions in service learning goals or how these experiences are structured (Mooney & Edwards, 2001).

The Commission on National and Community Service defines service learning as a method of learning that occurs through active participation in organized service to meet the needs of a community and that is coordinated in collaboration with schools and communities (Waterman, 1997). Service learning is employed in a variety of academic fields ranging from business to psychology to public policy. Because it is an evolving pedagogical approach, there is disagreement over some of the goals of service learning. Some scholars argue that service learning should promote feelings of empathy (Imperial, Perry, & Katula, 2007) and should be explicit in its goal of promoting social justice (Mitchell, 2008). But there is wide agreement that service learning must be structured so that students have opportunities to reflect on their experiences and use their skills in real-world settings and that the experience must align with curricula goals (Finley, 2011; Reason & Hemer, 2010; Imperial et al., 2007; Mooney & Edwards, 2001).

Moreover, because service learning is by nature transformational, many scholars agree that an important goal of service learning is to promote personal growth, with great attention paid to changes in attitudes toward the communities in which the student volunteers (Conway, Amel, & Gerwien, 2009; Finley, Ashley, 2011; Imperial et al., 2007; Research Institute for Studies in Education, 2010; Waldner & Hunter, 2008). Service learning is as varied in how it is carried out as in its goals and definitions. Commonly, service learning can be an element of a course (i.e., students in a Spanish course providing translation services at a community center) or, in its most formal, designed around the service learning experience itself. Whereas service learning most often takes place in a community, it is worth noting that it can also occur in a school (i.e., peer counseling or tutoring). The student reflects on his or her informal learning through formal processes.

Related to but distinct from service learning is civic learning. Unlike service learning, where volunteering to address the needs of a community is essential, civic learning can take place in both formal and informal learning environments and focuses on civic engagement and democracy building. One example of civic learning not associated with academic credit is a citizen science program in which volunteers assist scientists and naturalists in their research. In contrast, another example of civic learning, but in the classroom, is a college course on democracy and citizenship. Civic learning can also take the form of service learning but only when it engages students in activities that are central to democracy building, such as collaborative work, problem solving within a diverse group, or deliberative dialogue, to name a few(Finley, 2011; Reason & Hemer, 2010). Civic learning is also characterized as real-world problem-based learning (Finley, 2012).

Although both service and civic learning occur through organized experiences, volunteering is another important pathway for informal learning. The main distinction between service/civic learning and volunteerism is that volunteering does not explicitly focus on educational outcomes. Thus, while intentional consideration may not be placed on learning, volunteers can, of course, learn a great deal through their work. More precisely, volunteer work can be defined through the following four dimensions: volition (the degree to which one chooses to engage in volunteer work), remuneration (paid v. unpaid work), structure (formal v. informal), and intended beneficiaries (Cnaan, Handy, & Wadsworth, 1996). Volunteers may be unaware of the informal learning that occurs through their work because of the limited opportunities for reflection. The research on learning through volunteer work does show a strong association between the mission of the volunteer organization and the content of what is learned (Duguid, Mundel, & Schugurensky, 2013).

To what degree are students engaged in civic and service learning or volunteering? More than 70 percent of all college students report participating in some form of volunteering, community service, or service learning during their time in college, whereas 50 percent of students specifically participate in service learning (Finley, 2012). Community college students, however, have fewer opportunities to engage with faculty and peers or participate in social and academic activities outside the classroom (Taggart & Crisp, 2011). In 2011, about 25 percent of community

college students reported participating in service learning experiences (Finley, 2012). In terms of the general population, a Bureau of Labor Statistics report on volunteering states that about 63 million people volunteered through or for an organization at least once during the prior year, with women volunteering at higher rates than men, and non-Latino Whites volunteering at a higher rate (26.7 percent) than Blacks (19.7 percent), Asians (18.2 percent), and Latinos (15.5 percent) (U.S. Bureau of Labor Statistics, 2014). In recent years, colleges have been especially interested in civic and service learning as one approach to prepare traditional students for the workplace (Education Commission of the States, 2014).

As the United States continues to diversify and the economy becomes increasingly globalized, developing cross-cultural competencies becomes increasingly important, with service/civic learning and volunteerism providing pathways for exposure and improvement. Generally, the learner characterizes this form of learning as fun (Taylor & Caldarelli, 2004), which fosters positive attitudes toward such type of language acquisition (Eshach, 2007).

A wide range of experiences have been identified as service/civic learning and volunteerism; several best practices can be incorporated into any service/civic learning or volunteer experience to enhance informal learning, including reflection, dialogue, and, in the particular case of service and civic learning, a clear design that fosters linkages between the service experience and academic material. Without a doubt, reflecting on one's volunteer work is fundamental (Astin, Vogelgesang, Ikeda, & Yee, 2000; Conway et al., 2009; Cronin & Messemer, 2013; Finley, 2011; Imperial et al., 2007; Mitchell, 2008; Mooney & Edwards, 2001).Common reflection activities include discussions among students with professors and writing in journals and papers (Astin et al., 2000). Researchers have focused considerable attention on assessing students' reflections on their individual experience, yet little is known about learning that occurs relationally as students volunteer in the community (Finley, 2011). Dialogue not only between learner and educator but also among learners (for instance, students discussing their service experiences with one another) is shown to enhance learning and promote the learners' ease with the experience (Astin et al., 2000; Taylor & Caldarelli, 2004; Vadeboncoeur, 2006). For adult learners in particular, modest evidence shows that a hybrid course that incorporates service learning with online instruction better addresses their needs (Waldner & Hunter, 2008). Finally, scholars agree that learning is more effective when the service experience is clearly linked to the classroom curriculum (Astin et al., 2000). Specifically, Imperial et al. (2007) suggest incorporating a feedback loop that allows volunteers, faculty, and agency sponsors to offer input throughout the service experience. Such an approach enables students to develop a sense of ownership over the proposed task, establishing perceivable effects so that students, faculty, and community sponsors can gauge their accomplishments.

One area of service learning that has received much scholarly attention is that of assessing the outcomes of the student service learning experience. Student outcomes are more widely documented than are community outcomes. What is known about community outcomes suggests that they benefit as a whole from such engagement and advocacy (Robinson & Clemens, 2014). The lack of specificity as to how communities benefit, however, is problematic.

Broadly speaking, the student outcomes related to service learning can be grouped into four categories: academic (includes retention, college completion, GPA, etc.), personal (i.e., self-efficacy moral development, critical thinking), social (i.e., working well with others, leadership skills, tolerance), and attitudinal (i.e., changes in values and attitudes). But the development of outcomes or evidence related to general knowledge and skills is particularly thin (Finley, 2011), as is the research on civic outcomes (including behavior, skills, knowledge, and values).

Academically, ample evidence demonstrates that participation in service/civic learning positively affects both four-year and community college retention and completion rates (Astin et al., 2000; Finley, 2011; Taggart & Crisp, 2011). But the evidence that participation in service learning leads to better grades is conflicting (Taggart & Crisp, 2011). Service learning leads to an increased ability to apply and adapt knowledge (Eyler, Giles, Stenson, & Gray, 2001; Robinson & Clemens, 2014). A large body of evidence confirms that service learning increases student development in the areas of personal efficacy, identity, spiritual growth, and moral development (Eyler et al., 2001). Socially, one of the major outcomes of the service learning experience for students is developing the ability to work well with others (Eyler et al., 2001); modest evidence shows that participating in service learning improves leadership skills (Astin et al., 2000; Conway et al., 2009). Attitudinal changes are the most robust of the outcomes described (Reason & Hemer, 2010). Students participating in service learning demonstrate a reduction in stereotypes, commitment to service/activism, and greater racial understanding (Astin et al., 2000; Eyler et al., 2001).Scholars advocate that future research should examine the causal links between service learning and student outcomes. Such investigations should be designed to enhance the generalizability of the findings, investigate the long-term effects of civic and service learning, and disaggregate data to determine outcomes for underserved populations (Finley, 2012; Taggart & Crisp, 2011).

Opportunities and Challenges of Volunteerism and Service Learning

Several opportunities and challenges exist with volunteerism and service learning, as summarized in Table 6. Evidence shows that working with and in communities in which the learner may not have otherwise interacted fosters cross cultural competencies and an improved understanding of people from different ethnic and racial backgrounds (Finley, 2012). Some evidence suggests that participation in such experiences also facilitates more formal learning (Macintyre, 2012). Service learning is characterized as a more enjoyable form of learning; however, research shows that, over time, students' civic learning is neither robust nor pervasive (Finley, 2012). Therefore, although ample evidence points to some positive outcomes of civic and service learning, the immediate positive benefits wane over time. Another disadvantage of it is its tendency to reinforce existing hierarchies (Mitchell, 2008). The extent to which the location of the service learning experience shapes outcomes is also unclear (Vadeboncoeur, 2006).

The disadvantages articulated through critiques of service/civic learning echo underlying issues of equity in accessing such opportunities. For example, poor youths may not be able to take advantage of educational opportunities outside the classroom, which can be costly or simply not available (i.e., are there museums in rural environments for students to visit?). Compounding the inequity is the dearth of data on the outcomes of underrepresented students participating in service/civic learning. What is known about the benefits of participation in such programs does not elucidate important differences that may exist between the experiences of majority and minority participants. Volunteerism may combat some of the inequity related to access, and involvement in community organizations may provide citizens entrée to otherwise unattainable lifelong learning (Gouthro, 2012). Moreover, involvement in informal learning through participation in community projects has been documented to facilitate a return to more formal learning (Macintyre, 2012).

Table 6. Opportunities and Challenges of Volunteerism and Service Learning

Opportunities	*Challenges*
-Develop cross-cultural competencies -Foster positive attitudes toward learning -Facilitate return to formal learning	-Learning can be temporary -Can perpetuate inequalities

4. Mentoring and Coaching

Mentoring at work is a common form of learning that involves a more experienced worker's acting as a teacher, adviser, and sometimes advocate for a less knowledgeable worker—the mentee—who is learning. Through this relationship, the mentor shares advice and professional knowledge (Leavitt, 2011). Mentorship has been characterized as a reciprocal and collaborative relationship between a mentor and a mentee who work together toward shared learning goals (Zachary, 2005). Mentoring is both formally arranged and informally secured (Hansman, 2001; Welsh et al., 2012). It is sometimes learner led and self-directed, meaning that the mentoring relationship is independently obtained without an invitation from company superiors or human resources professionals (Misko, 2008). More organized but still informal mentoring partnerships may be set up by human resources or by managers (Hansman, 2000). This form of mentoring at work also may be used to acclimate new hires or as part of the orientation process.

Mentoring relationships may be structured in more or less effective ways. The levels within the organization of the mentor and mentee may make a difference. Mentoring may be less effective when the employee is just one level above the mentee in the organizational hierarchy (Ensher, Thomas, & Murphy, 2001). Generally, productive mentoring results ideally in new ways of learning for mentor and mentee and is mutually beneficial (Leavitt, 2011).

Mentoring relationships promote learning in the workplace, but learners may face challenges in successfully benefitting from these opportunities (Hansman, 2000, 2001). Arranged relationships, such as those in formal mentoring programs, do not always result in compatible matches between mentors and protégés, given personality and interests (Eby & Lockwood,

2005). Furthermore, individuals who because of race, class, gender, or sexuality are "different" from the dominant group may have difficulty finding mentors (Daresh & Playko, 1992; Hansman, 2001). Because relational learning lends itself to informal knowledge acquisition, some parties are naturally advantaged depending on the context. Those who have an easier time fitting in are offered greater relational learning opportunities.

In addition to mentoring, coaching is another important form of relational learning. Two types of coaching are prominent in the learning literature: group coaching and executive coaching. Group coaching, also known as team coaching, although a growing field (Hackman & Wageman, 2005; Hicks, 2010), remains small compared with executive coaching. Group coaching refers to the coaching of multiple employees at the same time (Hackm & Wageman, 2005) and at all levels. In contrast, executive coaching focuses on the training of company leadership to maximize personal potential and company profit. Executive coaching is strongly studied in the human resources literature and in the discourse of management (Passmore & Fillery-Travis, 2011) and is typically targeted to higher-level workers.

From the managerial perspective, coaching is an important form of learning that can generate more employee buy-in and strengthen the link between the organization and the individual (Persson, 2007). Reviewing the research on coaching, Passmore and Fillery-Travis (2011) reiterate concerns that executive coaches often promise quick results (not based on research outcomes) and may gain undue influence over CEOs. However, the researchers also highlight studies that provide evidence that coaching enhances learning, particularly compared with other types of job training. Their work observes that the effect of coaching is "situational," having a stronger effect in certain organizational contexts than in others. For example, Hackman and Wageman (2005) find that employees learn best when their cognitive load is not high. Deadlines and high-pressure environments do not afford time for learning. They suggest that coaching should be scheduled when task demands are lower and that coaching topics for employees should be differentiated depending the stage of the employees' careers.

Also similar to mentoring, peer-to-peer learning is composed of employees at the same level of career advancement who engage in a two-way relationship in which both parties learn (Eisen, 2001). These relationships are potentially powerful means of learning and promoting professional and personal growth (Eisen, 2001). Peer relationships may be particularly valuable to learning in three ways: utilizing the learner's expertise, working in a partnership that supports joint accountability for learning outcomes, and solving real-world problems (Eisen, 2001). Peer-to-peer learning relationships may be more productive for employees, as peers trusting each other can create a more dynamic learning partnership (Kram & Isabella, 1985).

Existing studies of peer learning do not fully elucidate the factors characterizing a successful peer learning experience. Research is mixed on whether peer-to-peer relationships are more effective than is hierarchical mentoring (Eisen, 2001; Ensher et al., 2001; Kram & Isabella, 1985). Much research has been done on the impact of peer-to-peer relationships in formal college education (Astin, 1993; Pascarella & Terenzini, 2005; Schroeder, 1994), but little investigation

has addressed peer relationships in more informal settings. In particular, the operation and efficacy of peer learning in blue-collar fields and low-wage workplaces is understudied.

Opportunities and Challenges of Mentoring and Coaching

Mentoring and coaching both offer several opportunities and challenges, as summarized in Table 7. A strength of these approaches to learning is that they provide knowledge that is context specific and relevant to the participants (Fenwick, 2008).Research offers some insight into the most effective strategies to promote learning, such as pairing peers with peers in mentoring relationships (Eisen, 2001; Kram & Isabella, 1985)or pairing mentees with more experienced mentors (Ensher et al., 2001). Some scholars emphasize the value of learner-led relational learning (O'Neil & Marsick, 2009), whereas others encourage learning communities that are co-opted by corporate interests (Persson, 2007; Servage, 2009). Overall, two sets of promising practices were identified. First, companies that support relational learning should encourage learners to end a relationship if it is ineffective (Hansman, 2001). If a relationship is not mutually beneficial, participants should feel free to speak up without suffering consequences or fear of retribution. Then, a new relational learning partner or group should be assigned. Second, when employees create relational learning groups, as is often the case with communities of practice, companies should not attempt to control the conversation (Persson, 2007). Relational learning groups that are completely controlled by an externally imposed agenda will not be conducive to transformational learning. Learners are more invested in a group when they can control its direction (Angelle, 2008; Wenger et al., 2001).

Table 7. Opportunities and Challenges of Mentoring/Coaching and Communities of Practice

Opportunities	*Challenges*
- Learners gain relevant knowledge - Greater connection to profession and/or employer - Knowledge is shared and built on -Opens pathways to additional learning	- Depends on participation of learners - Little quality control and potential for unproductive or counterproductive learning - Social learning can send messages that diminish self-esteem or do not promote overall success - Unequal access

5. Communities of Practice

Lave and Wenger (1991) developed the concept of communities of practice as the set of relationships that exist around a body of knowledge, also referred to in the literature as professional learning communities. They emphasize the importance of the social context for knowledge transfer that is reflected in the interrelationships among learners in a community, the particular practice, and their broader knowledge of the world. Here we focus primarily on communities of practice at work, where collectives of employees engage in collaborative informal learning about their particular profession; they have a defined purpose and process largely dictated by participants and with varying degrees of organization. The concept is

shaped by the notion of situated learning that asserts that what we know and what we learn cannot be distinguished from our environment (Lave & Wenger, 1991). As such, cultural norms, peers, and other local frames of reference shape workplace learning, and learning takes place in social relationships rather than through the simple acquisition of knowledge.

Members can leave at any time, company leadership typically dies not create these groups, and no hierarchy is assigned. Lave and Wenger (1991) list three components that are critical for distinguishing a learning community from other groups of employees and from more formal organizations. The first component is domain or the topic of shared interest, such as business or health care. The second is the community or the membership that is typically defined as participants who share mutual respect and trust. To become an official community member, an individual must work in the relevant domain and express buy-in or commitment. Because such communities are informal and voluntary, both belonging and engagement are essential. The third component is practice or working knowledge, including strategies and experience that can be shared with others (Angelle, 2008).

Learning communities can serve many goals, including the creation of a professional culture in the workplace and a unified worker identity (Servage, 2009). In work settings, both unions (McClure, 1999) and employers have an incentive to create such communities, though the purposes of these groups may differ. Another goal is to make professional norms more explicit (Servage, 2009). Professional learning communities and communities of practice might empower employees, help them reflect on the power structure of their workplaces, and enable them to work together to change that structure to their benefit (Fenwick, 2008).

Research on teachers and their professional practice involves communities of practice. Angelle (2008) studies such communities of practice in the school setting to determine how teachers promote shared success. Group members negotiate meaning and understanding within the workplace, and these communities of practice form the link between the individual and the community and encourage a positive and productive identity. In their review of research on communities of practice in business and healthcare, Li et al.(2009)find that primarily qualitative studies best explain how these communities function but reveal less about their effectiveness. Some evidence suggests that these communities of practice, in comparison with traditional training programs, may be more relevant to employees than is formal training because information is presented in a coherent way, reflecting how people learn(Brown & Duguid, 1991).

Hellner's (2008) literature review of professional learning communities in teaching identifies several fundamental characteristics: a shared and supportive management that nurtures leadership among its staff, permitting distribution of power, authority, and decision-making and shared values and a vision that evolves from the staff's values. Such an approach leads to the development of staff-supported behaviors and the practice of collective learning and collaboration—teachers seek new knowledge, skills, and strategies; share information; and work together to solve problems and use real site-based challenges for learning opportunities.

Teachers share personal practice (job-embedded professional development) and create supportive working conditions, including school structures, resources, open communication channels, and trusting and respectful relationships. This description, an ideal type of a professional learning community, is one from which both employees and employers benefit.

Opportunities and Challenges of Communities of Practice

Communities of practice offer several opportunities and challenges; these overlap with those summarized in Table 7 for mentoring and coaching. According to Hellner (2008), multiple benefits exist, including reduced isolation, increased job satisfaction, higher morale, decreased absenteeism, and increased commitment. Improved individual satisfaction and learning also benefit the organization. A learning community can help stimulate buy-in and increase employee belief in the value of daily practices and structures (Servage, 2009).

This type of learning, however, may not be inherently productive and may serve to perpetuate power inequities. For example, gangs share all the components of situated learning and communities of practice (Lave & Wenger, 1991). Additionally, communities of practice, if uncritical of the existing power structure, may prevent workers from questioning and attempting to change the social order (Servage, 2009). Co-opted learning communities and communities of practice do not provide the same opportunities for critical learning and sharing when their content and purpose have been predetermined. Furthermore, relational learning can also produce social conformity and performance obsession, especially when production is the goal of relational learning. In this case, the participants may become overwhelmed by performance goals and lose sight of the learning process (Persson, 2007).

Furthermore, such opportunities are not equally available to learners. The learning goals can influence this inequality; if the learning opportunities were established for the sole purpose of improving managerial and company performance, a shortage of learning communities in certain domains or at certain levels of employment could occur. Management rarely targets minimum wage and low-skilled workers, who may not have the network to seek such opportunities on their own. Models to enhance strategic human resources encourage companies to spend more on higher-skill employees, with only a minority of organizations providing opportunities for all workers (Lepak & Snell, 2002).

B. Everyday Informal Learning in the Workplace

Substantial learning occurs in the course of everyday life. Particularly in the workplace, a majority of learning is informal, occurring experientially through everyday activities (Billett, 2001; Le Clus, 2011). Early estimates by Tough (1978) concluded that 70 percent of learning occurs informally, 20 percent through coaching, and 10 percent via formal instruction. More recent estimates show similar results. According to current studies, 75–80 percent of learning at work is done informally(Perrin & Marsick, 2012; Halliday-Wynes & Beddie, 2009). Regardless of the actual percentage, most researchers of workplace learning agree that informal learning is a

significant part of learning on the job. This review focuses primarily on the everyday learning that occurs in the context of the workplace as discussed in the workplace learning literature. When appropriate, everyday learning in other relevant contexts is discussed.

A major feature of everyday informal learning is that its content emerges from situational needs rather than from an established curriculum. Dale and Bell (1999a) define informal learning as taking place in the work context as it relates to an individual's performance of his or her job and/or employability; thus, this learning is not formally organized into a program or curriculum by the employer. Others concur that informal learning is not restricted to a predetermined body of knowledge but, rather, often stems from experience or interactions with others (Le Clus, 2011; Marsick & Watkins, 1990).Because it is not structured, everyday learning can sometimes be described as haphazard, idiosyncratic, and driven by serendipity (Le Clus, 2011). However, although informal learning within the workplace may be called ad-hoc or unstructured, a structure does in fact exist to ensure that workplace practices occur with continuity and are guided by workplace norms (Billett, 2002). Rather than haphazard, workplace learning in fact is extremely structured in fulfilling its main goal: to ensure that workers can perform very specific tasks.

In this section, we discuss the three main subtypes of everyday learning in the workplace—self-directed learning, incidental learning, and tacit learning—and their opportunities and challenges. We then review the ways that workplace structures influence everyday informal learning opportunities in the workplace.

1. Subtypes of Everyday Informal Learning

Multiple types of everyday informal learning have been defined. Two characteristics distinguish the different types: the degree of intentionality in the pursuit of learning—whether the learner is self-directed and aware of the learning experience. The distinctions between these subcategories of informal learning are not always clear and are the subject of ongoing study (Jacobs & Park, 2009; Livingstone, 2001). For this review, we examine three subtypes of everyday informal learning in the workplace: self-directed learning, incidental learning, and tacit learning.

Self-directed Learning in the Workplace

In contrast to other types of everyday informal learning, self-directed learning occurs when the learner intentionally seeks out a learning experience and is aware when it occurs (Schugurensky 2000). According to Knowles (1975, 1984), self-directed learning occurs when a learner wants to learn how to do something or demonstrates an interest in a topic and then takes the initiative to either actively seek a learning opportunity or further information. Such learning draws heavily on the learner's experiences, is problem centered, is motivated by the learner's internal incentives, and is judged to be successful or not by the learner (Knowles, 1975, 1984). Whereas learners engaged in self-directed learning can seek out formal learning and/or organized

informal learning experiences, in this section, we instead focus on individualized learning that is self-directed in the context of everyday experiences.

This concept of self-directed learning emerges from foundational ideas about adult learning. Knowles (1975, 1984, 2012) argues that adult learning assumes that this population is motivated to learn by the need for knowledge, has the capacity for self-direction, draws on prior experiences when learning, and is ready to learn when necessary. Thus, the need for knowledge motivates this learning, and learners are driven by learning that fulfills internal goals rather than external rewards. This model of learning stands in contrast to the teacher-directed learning or formal learning modes typically used with children in the traditional classroom.

Self-directed learning includes many activities initiated by the learner in search of skills or knowledge. For example, self-directed learning can be an action as common and mundane as conducting a Google search to answer a question. Eraut's (2000) typology of workplace learning includes workers' intentionally asking questions, gaining information, identifying resource people, listening and observing, reflecting, learning from mistakes, giving and receiving feedback, and examining objects. Despite the constant nature of self-directed learning, however, some scholars emphasize the need for reflection to solidify this form of learning. According to Brookfield (1986), self-directed learning is a process whereby individuals learn to change their perspectives on the world though reflection and action.

Although self-directed learning focuses on the individual learner, in the workplace, this learning occurs in an organizational context. Littlejohn, Milligan, and Margaryan (2012) discuss a similar concept of self-regulated learning, observing that mechanisms in the workplace that link individuals to each other and to the collective can promote self-regulated learning, including discovering information, establishing and maintaining networks, and sharing information. The role of the organizational context in facilitating self-directed learning is discussed below.

Incidental Learning in the Workplace

Incidental learning is distinguished from self-directed learning by the degree of intentionality involved. With incidental learning, the learner is not aware prior to the experience that learning will occur. The learner does not intend to seek out learning, experiences learning, and realizes what happened. Learning, in this case, is an unexpected byproduct that occurs in the normal course of daily events without a high degree of design or structure (Le Clus, 2011; Marsick & Watkins, 1990). It can occur through mistakes encountered while performing regular tasks, experimenting via trial and error, making observations and repeating actions, solving problems, completing challenging tasks, and engaging in interpersonal interactions in social situations (Eraut, 2000; Le Clus, 2011; Victoria Marsick & Watkins, 1990).

With incidental learning, everyday experience is critical. As learners adapt to their environments, they are reactive and internalize the experience. Carliner (2014) notes that

informal learning is often triggered by actual problems encountered in daily activity. Performance can be enhanced or inhibited if the learning is faulty because it occurred without specified formal instruction.

Tacit Learning in the Workplace

With tacit learning or socialization, the learner does not intentionally seek out learning and has no awareness of the learning after it has occurred. Through daily life experiences the learner may unconsciously internalize values, attitudes, behaviors, and skills such as the ongoing practice of a game, learning how to perform a complex task like riding a bike, something that may not be easily explained verbally, but can be performed without awareness after mastery (Eraut, 2000). In addition, such learning encompasses the development of ideas and attitudes, exposure to culture, learning norms acquired through socialization.

Tacit learning is embedded in our mental, emotional, and interpersonal frameworks for processing information (Marsick & Watkins, 1990; Marsick et al., 2006). Because it occurs during the performance of everyday activities, such as conversations and social interactions, this type of informal learning can be easily overlooked, although it can powerfully affect the development of attitudes, values, skills, and knowledge that are part of daily routines (Le Clus, 2011). Although it is unconscious, tacit learning helps develop skills and knowledge that can be used in practice and serve as a foundation to promote ongoing learning (Eraut, 2000). Tacit learning typically is interwoven throughout the course of other types of learning(Le Clus, 2011). Tacit learning generally serves organizational needs by preparing its employees to support the goals of the workplace; the degree to which socialization benefits individuals has not clearly been studied.

Opportunities and Challenges of Everyday Learning in the Workplace

Numerous benefits from workplace learning exist for both individuals and organizations. Some benefits are accrued by the employees as increased human capital; employees become more employable and have greater self-confidence and awareness of their abilities (Dale & Bell, 1999; Noe et al., 2014). The organization also benefits from employees' improved performance. With workplace learning, the content of learning can be adapted to meet the needs of the company (Dale & Bell, 1999; Noe et al., 2014). Learning is rapidly translated into practice as employees better understand the company and how their work fits into its other processes and goals. Learning embedded in the workplace can help resolve work-related problems as practices and performance are reviewed and new ideas encouraged (Dale & Bell, 1999). Finally, improved relationships may emerge between colleagues and managers and lead to an overall improved work environment (Dale & Bell, 1999; Noe et al., 2014).

Although many scholars tend to view informal learning within the workplace positively, others have analyzed its challenges in relation to its processes and learning outcomes (Skule, 2004). Taking an employee-centered and broader social perspective, scholars have argued that the

emphasis on and interest in informal learning within the workplace overlooks and/or obscures a variety of problematic issues. Fuller and Unwin (2003) wonder whether an overvaluing of informal learning could lead to fewer opportunities for employees to participate in formal "off-the-job" training. Along with reducing opportunities for expansive participation (Fuller & Unwin, 2003; Fuller & Unwin, 2004), they raise the issue of knowledge control within the workplace to ensure that workers have equitable access to learning opportunities. One problem with encouraging adult learning is that the learned keep learning—that is, those who are most knowledgeable tend to learn the most (Boeren, Nicaise, & Baert, 2010). Furthermore, as discussed previously, a significant concern about informal learning in the workplace is how to achieve a balance between employee learning and organizational learning, whose goals often do not coincide (Billett, 2001; Manuti et al., 2015).

In addition to issues of access and power, several challenges result from informal workplace learning. Such learning can be too narrowly based so that employees only learn part of a task or acquire superficial skills that may not be transferable to other situations (Dale & Bell, 1999b; Smith, 2003), a particular concern when the learning is unconscious and unrecognized by the learner. Another related and serious concern is that employees may learn bad habits or the wrong lessons (Dale & Bell, 1999; Manuti et al., 2015). In addition, informal learning can be a circuitous and possibly inefficient process (Carliner, 2014). Because workers might not realize that they need new knowledge to solve a problem, they may choose inefficient methods. For instance, if a worker chooses a shortcut that does not work, he or she will be forced back to the drawing board to choose a more appropriate method to solve the problem. Making learning more structured and explicit may produce more useful and more accurate learning experiences. Finally, another potential problem with everyday learning in the workplace is that is it often difficult to accredit or use for formal education qualifications (Dale & Bell, 1999). Some processes, however, have been put in place, such as industry certifications and prior learning assessments, to address this issue, although these may not always be relevant or accessible to learners. Table 8 summarizes both the opportunities and challenges associated with everyday learning in the workplace.

Table 8. Opportunities and Challenges of Everyday Learning in the Workplace

Opportunities	*Challenges*
- Prepares employees to support the goals of the workplace by adapting learning to meet specific company needs - Learning is rapidly translated into practice -Helps resolve work-related problems -Improves relationships between colleagues and managers	- Not equally available to all workers - Learning may not be transferrable -Difficult to accredit or use for formal educational requirements - Employees may learn bad habits or the wrong information

2. Influence of Workplace Structure on Learning

To understand the opportunities available for everyday informal learning in the workplace, it is essential to understand the structure of the workplace itself. Not all workplaces offer the same opportunities for learning. How work is organized and what organizational support for learning is available directly affect the type and quality of informal learning. Billett (2001) argues that there can be no separation between working and learning because the act of work continually provides opportunities to learn and, for many people, the workplace is the only setting where they can learn about work practice. He also notes that learning is not equally available to all workers and varies by status and ability to take advantage of any opportunity. Furthermore, to promote learning, workers need guidance and support along with challenging tasks in their work. These issues are discussed further throughout the remainder of this section.

Prior research has identified multiple factors in the workplace that influence opportunities for informal learning. Kim and McLean (2014) observe how the organizational environment affects workplace learning and mention career development policy, the human resource system, and job assignments. Similarly, Noe, Clark, and Klein (2014) identify other factors that affect how people learn in the workplace, including work-family balance; the interactions among team members to process and share knowledge; task characteristics such as autonomy, level of challenge, and accountability; and job crafting or the degree to which employees can shape their jobs. Eraut (2009)notes that if the work is neither challenging nor valuable to the learner, and a culture of feedback and support was not created in the organization, then learning will be negatively affected. Billett's (2001) idea of co-participation provides an interesting framework for workplace pedagogy. He describes the relationship between opportunities for learning at work, individuals' engagement with these opportunities, and workplace support for learning. Activities and interactions in the workplace offer opportunities for learning based on available resources, values and norms, and individuals engaged in learning based on their knowledge and values. A critical goal in workplace learning is shared learning between the manager and the employee (Billett, 2002).

In this section, we discuss several key characteristics of organizations that affect learning opportunities: organizational approaches to learning, the way jobs are structured, and organizational support for learning available in the workplace.

Organizational Approaches to Learning

Organizational learning is a concept that focuses on the processes within organizations that purport to promote continual improvement and learning in the face of uncertain and often changing economic realities (Senge, 1990; Watkins & Marsick, 1993). A learning organization is defined as one that promotes ongoing learning through formal learning experiences but, potentially more importantly, also does so through everyday learning by fostering an environment of continual learning and transformation of practice. Organizational learning occurs when individual learning and problem solving is seen to affect organizational processes;

individuals learn, and their learning combines and forms collective knowledge (Ellstrom, 2001; Watkins & Marsick, 1993). Senge (1990) identifies several essential elements of a learning organization—teams have core capabilities to understand complexity, to engage in reflective conversation, and to aspire to mastery, and they contribute to a shared vision. Watkins and Marsick (1993)highlight several actions that promote a learning organization, including offering continual improvement opportunities, promoting inquiry and dialogue, encouraging collaboration and team learning, establishing systems to capture and share learning, empowering workers to embrace a collective vision, and connecting the organization to its environment. Learning organizations involve greater participation in decision-making by a broad group of workers and an organizational leadership that supports this type of participation and learning (Marsick, Bitterman, & van der Veen, 2000).

Fuller et al. (2007)propose two types of organizations in terms of their general approach toward learning and the resulting learning environment: restrictive or expansive. In a restrictive environment, learning opportunities are focused on the short-term and immediate needs of the job, all learning happens in the workplace, little opportunity is provided to reflect beyond the task, and no opportunities for off-site training are offered. In contrast, in an expansive environment, learning opportunities are focused on long-term career development and can occur across a range of opportunities beyond the immediate job requirements. In this environment, the management promotes the creation and sharing of knowledge.

Job Structure and Learning

The way jobs are structured can lead to natural learning from opportunities for growth and learning inherent in the work itself (Misko, 2008; Watkins & Marsick, 1993). Jobs structured around multi-skilling and cross-skilling, including greater rotation among different tasks, can lead to expanded opportunities for learning. Likewise, if jobs are structured with more complex tasks, then they lead to more learning. Furthermore, some conceptualize learning opportunities at work based on the specificity of the tasks, methods, and results of the activity in which the worker engages (Ellstrom, 2001). With this framework, some learning opportunities may offer a great deal of openness in how they are carried out (developmental learning) in contrast to tasks whose specifications for accomplishment are clearly delineated (adaptive learning). Furthermore, Ellstrom (2001) identifies several factors in the workplace that determine how much and which type of learning is most likely to occur, including the complexity and variety of the task, existence of feedback, formalization of work processes, degree of employee involvement in solving problems, and resources available for learning.

In addition to how jobs are defined, additional practices referring to how work is done can influence learning opportunities, including working in teams, working alongside others which provides a chance to develop an awareness of other practices, consulting with others outside of the work group, and experimenting with new tasks and roles (Eraut, 2007). Through these situations, learning may occur as workers ask questions and gain information, identify people from whom they can learn, listen and observe work activities, learn from mistakes, give and

receive feedback, and review examples of work products from practice (Eraut, 2007).Teamwork can also enhance learning (S. Kim & McLean, 2014). Everyday informal learning is largely influenced by the context, especially social interactions, the nature of the activity (such as whether it is routine), and how the person frames and approaches the problem (Le Clus, 2011; Marsick & Watkins, 1990).

Workplace policies regarding direct participation, such as employee involvement in decision-making and influence over immediate work tasks, are also associated with learning in the workplace (Inanc, Zhou, Gallie, Felstead, & Green, 2015). Research supports Taylorist critiques that an absence of worker discretion undermines creativity, diminishes room for self-development, and challenges the general agreement that task preference leads to learning. Organizational decision-making is a means to promote learning because such involvement increases worker buy-in and leads to more effective policy implementation. Inanc et al. (2015) suggest that different forms of direct participation may lead to different types of learning and that different forms of learning may be more or less effective depending on the type of worker. They propose that informal learning occurs in two ways—learning by doing and sharing knowledge. They find that older workers learn less through knowledge sharing and that lower-level jobs provide fewer opportunities for learning. They also conclude that both employee involvement in decision-making and their influence in determining immediate work tasks are important for high-quality learning. The demands of worker tasks are linked to learning by doing, and organizational participation is linked to knowledge sharing. Likewise, task discretion had the greatest effect on informal learning for lower-skilled occupations.

Organizational Supports for Learning

How workplaces are structured reflect organizational politics toward learning in terms of how work is structured to create opportunities for learning (Garrick, 1998). In this view, learning at work is increasingly viewed as a commodity, particularly if a large portion of the workforce is engaged in narrowly focused jobs with few opportunities for learning. Given the widespread inequities of access to learning opportunities in the workplace, the debate about creating learning organizations must recognize the existence of power differences and conflicts. To this end, union negotiations sometimes include multi-skilling and the promotion of more semi-autonomous teams as issues to negotiate (Garrick, 1998).

Several types of organizational supports can promote workplace learning, including managerial support, specific workplace policy, and tangible resources. Managerial support is important for fostering learning, but managers must also have the skills to support learning for their workers. Activities that managers can adopt to promote learning include instructing, demonstrating, shadowing, role modeling, providing opportunities to practice, and offering constructive feedback. The structure of jobs is also relevant, and managers can help by providing additional guidance to workers through task breakdowns or checklists (Dale & Bell, 1999). The active role of managers in guiding detailed work, however, can also result in making work too prescriptive, thereby removing potential learning opportunities from workers (Dale & Bell,

1999). From the perspective of a learning organization, the role of managers in promoting a culture of inquiry that allows for questions and mistakes is essential. Although a manager may support learning through wide-ranging options, these may occur infrequently. Eraut (2007) concludes that managers' direct supervision of informal learning is quite uncommon. Closer relationships between supervisors and workers are linked to greater support for learning(Kim & McLean, 2014).

Human resources and organizational training policies in the workplace play an important role in supporting workplace learning. Based on a review of the educational literature, Smith (2003) highlights the importance of training policies in creating such a learning environment. In particular, training structures and practices can support the development of learning in a flexible manner, developing technologies for learning, and making learning an articulated priority within the context of production goals and targets. Likewise, based on the human resource development literature, Sambrook's (2005) framework for understanding work-related learning identifies human resources policies and practices as a distinct positive factor and highlights their potential role in initiating and supporting workplace learning—both everyday workplace learning and more formal classroom-based workplace learning. Human resources staff can promote self-directed learning in workers and foster a culture to support workplace learning (Watkins & Marsick, 1993).

In addition to support from managers and stated human resources policies, workers also need resources, including access to information (i.e., manuals, coaches, subscriptions to ongoing sources of information in the field; shadowing opportunities and visits to other worksites; conferences and short courses; and independent study to earn qualifications) and interactions with other workers (i.e., modeling, coaching, mentoring, questioning others, working groups, and teams) (Billett, 2001; Carliner, 2014; Eraut, 2007; Misko, 2008). Both workers and employers need to learn to view informal learning as a legitimate part of work. Employers can support informal learning by providing formal permission and by modeling behaviors. Providing adequate resources to support their organization's informal learning policies can promote efficiency of learning at work (Billett, 2001; Carliner, 2014).

III. UNDERSTANDING THE IMPACT OF INFORMAL LEARNING

Given the many types of informal learning discussed above, we now examine what we know about the potential effect of such learning on learners. We examine what is known about how much informal learning actually occurs and how it can be measured. Furthermore, the ways in which informal learning can be recognized as something of value in the lives of learners are crucial to understanding its role and impact. In this section, we first provide an overview of how informal learning is recognized and measured. Then, we present some of our findings' implications and explore remaining unanswered questions.

A. Efforts to Measure Informal Learning

Compared with formal learning, data on the value of informal learning are sparse. Only a handful of surveys in the United States have focused on the incidence of informal learning, and none are recent. The National Center on Education Statistics' National Household Education Survey (NHES) in 2001 collected information on participation in adult education and lifelong learning from a national sample of U.S. adults. A wide range of activities, defined as "work-related informal learning," including workplace trainings, mentoring, self-paced study, attending presentations and conferences, and reading professional materials. The survey found that nearly two-thirds of adults had participated in at least one such activity within the year prior to the survey (K. Kim, Hagedorn, WIlliamson, & Chapman, 2004). In addition to the NHES survey, the Bureau of Labor Statistics (BLS) conducted the Survey of Employer Provided Training (SEPT) in 1995, collecting in-depth information from a national sample of employers on the incidence and intensity of learning opportunities offered to workers. The SEPT included a questionnaire and logs for both the employer and employees to track the actual occurrence of learning over a specific period. Findings indicated that the majority of employees reported experiencing informal learning on the job on an average of over 30 hours during a six-month period. Currently, surveys on the issues covered in both these questionnaires are under development (Bielick, Cronen, Stone, & Roth, 2013; Medway & Cronen, 2014).

Data collection in other countries provides additional insights into the incidence of informal learning. In Canada, the Work and Lifelong Learning (WALL) surveys provide estimates of informal learning and show that the number of adults engaging in informal learning is similar to the estimates generated by US surveys (Livingstone & Raykov, 2013). The Canadian study examining the incidence of everyday informal learning or self-directed informal learning included activities at work, volunteerism, household pursuits, and general interests. These surveys sought to develop strategies to better measure incidents of informal learning by examining occurrence within the context of daily life (Livingstone, 1999, 2001). In addition, in 1988, the Canadian General Social Survey (GSS) included questions about informal learning in its national sample of adults. These questions focused on self-directed learning, including the topic of study and the number of hours devoted. Another Canadian study with a focus on workplace learning is the Workplace and Employer Survey (WES, 1999, 2001, and 2003), the last conducted in 2006.

Several surveys taken from other national contexts also estimate the occurrence of informal learning. The OECD Program for the International Assessment of Adult Competencies (PIACC) measures informal learning at work and reports that learning by doing is more important than is learning from coworkers and supervisors (De Grip, 2015). The European Union began measuring informal learning in 2010 as part of an effort to increase adult informal learning throughout the life course (Boeren & Baert, 2010). Two surveys in the European context, the Labor Force Survey and the Adult Education Survey, measure the amount of informal learning and illustrate the importance of context. Across EU countries, lifelong learning is reported to occur between 35 to 50 percent. The majority of adults 25–66 years old in the Australian context

exhibit a similar trend (Halliday-Wynes & Beddie, 2009). Both using the Internet and reading were identified as the most universal types of informal learning.

Several researchers noted problems and challenges in measuring informal learning. Despite efforts to collect such data, most such efforts do not capture the most informal end of the learning continuum. In particular, tacit learning—which is unintentional and unrecognized—lacks attention and systematic study (Eraut, 2009). Second, studies can contain a class bias when social and cultural learning is deemphasized in the survey questions, despite their importance in some marginalized communities (Livingstone, 2001). For example, such studies might ask about Internet usage but ignore learning from a grandmother or grandfather. Furthermore, some conclude that such research has been focused on large white-collar institutions, excluding smaller ones (Halliday-Wynes & Beddie, 2009). This omission may bias findings on the type of training offered because large institutions generally support a greater number of more formal training courses. Finally, much of the research on informal learning has been qualitative case studies (Marsick, et al. 2006). Clearly, the need exists for additional wide-scale in-depth studies that provide a more complete understanding of informal learning.

B. Strategies to Recognize Informal Learning

Although the actual magnitude of informal learning is unknown, a great deal of learning clearly occurs outside of formal education. Several strategies have been developed to recognize and translate such informal learning into value for the learner. Some allow for translation into credentials—either educational credentials conferred through the formal education system or other types of credentialing, such as industry certifications, professional licensure, and emerging forms such as badges. Alternative approaches bring direct benefits to workers on the job such as career ladders that reward ongoing learning and performance. Sometimes strategies bring together educational credentials and rewards at work through learn and earn models. We discuss each of these strategies for recognizing informal learning.

1. Prior Learning Assessment (PLA)

PLA is an individualized form of assessment specifically designed for adult learners in which their skills and competencies—developed through prior formal or informal training—work experience, and life experience[2] are recognized. These skills and competencies are reviewed,

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In the 1940s, the American Council on Education established services to support veterans in attaining credit for their military service (Ryu, 2013). Recognizing that little was being done nationally to capture such large investments training employees and providing workplace education, in 1974, the Council for Adult and Experiential Learning (CAEL) expanded these services into what is commonly referred to as Prior Learning Assessment (PLA) (Stevens, Gerber, & Hendra, 2010). PLA is becoming a worldwide model for recognizing informal learning as Australia and New Zealand, Southern Africa, Europe, and North America have adopted this form of assessment (Stevens et al., 2010).

evaluated, and awarded academic credit, which can be applied toward the completion of a degree (Bateman, Knight, & National Centre for Vocational Education Research, 2003; Stenlund, 2013; Wihak, 2011). A learner can attain advanced standing in the educational institution and/or credit in a recognized training program (Bateman et al., 2003). Therefore, not only is the assessment of learning intrinsic to this model, of equal importance is the fact that informal learning becomes recognized (Andersson, Fejes, & Sandberg, 2013; Bateman et al., 2003), a reason PLA is also referred to as recognition of prior learning.

Although there is no nationally representative data on PLA enrollment, two large-scale studies provide some insight into who takes advantage of PLA opportunities. One study of 48 (including four- and two-year) colleges finds that PLA students compose between 17 and 36 percent of the adult learner population (Klein-Collins, 2010). A more recent exploratory study (including 414 colleges and universities) finds that prior learning credit seekers are, on average, middle-aged, white, female, and employed fulltime while pursuing baccalaureate degrees (Ryu, 2013).

Whereas there are many ways to assess prior learning, portfolios and exams are the two most prominent methods. Exams can be nationally standardized, like the College Level Examinations Program (CLEP), or customized to the particular educational institution. Portfolios can include degree plans, goal statements, resumes, learning autobiographies, narratives or competency statements, and other documentation that supports learning claims (Stevens, Gerber, & Hendra, 2010). In addition, skills and/or knowledge demonstrations and evaluations of military service are the major types of assessments associated with crediting prior learning. CAEL proposes 10 best practices for PLA programs, with a focus on how assessment should be conducted and how credit should be awarded (Travers & Evans, 2011). In addition to these practices, scholars suggest using PLA credit to obtain advance standing in academic programs (Klein-Collins, 2010); they also suggest that quality assurance measures should be transparent (European Civil Society Platform on Lifelong Learning, 2015).

PLA implementation still faces challenges. Most prominent is the variation in policies for assessing and crediting prior learning (Krupnick, 2015; Ryu, 2013). The policy landscape is complex, with school-level policies varying from department policies. Coupled with poor administrative processes, the results are an increased workload for assessors along with making PLA labor intensive, costly, and time consuming (Bateman et al., 2003). Given these challenges, it is not surprising that students often lack clear and consistent information about PLA options (Ryu, 2013). Federal funding for PLA, which may offset some of these challenges, may also provide an incentive for prior learning credit to be too easily awarded as colleges compete for enrollment of adult learners (Krupnick, 2015). Finally, prior learning credits are often awarded as elective credit (rather than credit toward a student's major)—not always meeting the adult learner's needs (Ryu, 2013).

Despite these challenges, recognizing informal learning through PLA is clearly beneficial for adult learners if the ultimate goal is to attain a more formally educated workforce. PLA does

improve access to higher education and streamlines the completion of a post-secondary degree or credential. Because few formal opportunities to reflect upon and ultimately recognize one's informal learning exist, the assessment process itself is valuable to adult learners, as it allows them to reflect upon and demonstrate their informally gained knowledge.

2. Certifications and Licenses

Industry certifications and licenses are credentials obtained through an examination process. The NCES Federal Interagency Working Group on Expanded Measures of Enrollment and Attainment (GEMEnA) has been working to clearly define the parameters covered by each of these credentials and to develop strategies to measure their prevalence and links to employment outcomes. According to GEMEnA, the definition of a certification is "a credential awarded by a certification body based on an individual demonstrating through an examination process that he or she has acquired the designated knowledge, skills, and abilities to perform a specific job. The examination can be written, oral, or performance-based" (Ewert & Kominski, 2012, p. 2). The definition of a license is "a credential awarded by a licensing agency based on predetermined criteria. The criteria may include some combination of degree attainment, certifications, certificates, assessment, apprenticeship programs, or work experience" (Ewert & Kominski, 2012, p. 2).

Industry certifications and licenses allow learners to document their skills and knowledge through a formal examination process. However, certifications are exclusively exam based, whereas licenses may also rely on other criteria for their award, sometimes including formal educational credentials. Certifications are frequently offered as part of a traditional educational program but can be obtained by individuals regardless of whether they have taken a traditional educational program or developed their skills and knowledge on their own (Bartlett, 2002). Certifications can serve as alternatives to the traditional credentialing system but also exist in tandem with formal education. When embedded in programs of study, certifications can help shape standards and competencies; increase program relevancy, consistency of results, accountability, and nationally portable credentials; and control educational costs (Wilcox, 2006).

The variety of industry certifications available has been growing in recent decades (Wilcox, 2006). Many industries, including automotive, information technology, medical, building trades, and manufacturing, offer certification (Bartlett, Horwitz, Ipe, & Lui, 2005). Information technology certifications have been widely studied after their proliferation during the technology boom of the 1990s (Adelman, 2000; Bartlett et al., 2005; Haimson & Van Noy, 2004). They provide an illustrative example of how industry certifications can provide an opportunity to translate skills into a documented and recognized credential. With such certifications, anyone can register for an exam; many people with work experience or personal interest could study on their own. As such, they would be able to translate their informal learning into a credential.

Licenses differ from certifications in critical ways: they are required for practice in certain occupations, and although they can include examinations of skill, they also can be based on

other factors such as work experience and/or educational credential attainment. To the extent that they are based solely on examination performance, they can provide opportunities for informal learning to be translated into a valuable credential. The prevalence of licenses across occupations in the United States has increased in recent decades, and it is estimated that 20 to 29 percent of the workforce are in occupations where licenses exist (Kleiner & Krueger, 2010, 2013).

Recent efforts by GEMEnA to improve data collection on alternative educational credentials, like industry certifications and licenses, have provided some estimates on their national prevalence. Based on estimates from a pilot Adult Training and Education Survey (ATES) conducted in 2010 along with the 2012 results of the Survey of Income and Program Participants (SIPP), from about 22 to 30 percent of US adults reported having a certification or license (Bielick et al., 2013; Ewert & Kominski, 2012). Another national estimate of licensure estimates that 29 percent of the workforce is required to hold a license (Kleiner & Krueger, 2010). All research indicates that certifications and licenses are more common among workers with higher levels of education than among those with only a high school degree or some college (Bielick et al., 2013; Ewert & Kominski, 2012; Kleiner & Krueger, 2010).

Data about the effects of these credentials on earnings are mixed. Licenses are estimated to be associated with 18 percent higher wages (Kleiner & Krueger, 2013). Less is known about the value of certifications. Because certifications have proliferated in today's educational and professional marketplace, confusion may exist among employers and learners alike about these credentials' value. Efforts are currently underway to clarify the many types of credentials available and to make information available on their value (Ganzglass & Good, 2015) The worth of industry certifications is particularly unclear. Prior research on certifications in the IT and automotive industries indicates mixed understanding of these credentials and their use in hiring, especially in the IT industry (Bartlett, 2002, 2004). Large-scale studies of the outcomes of industry certifications and licenses are limited by the lack of data on certification holders; however, current initiatives seek increased access to data and to link that data with wage outcomes (Massie, 2014).

In addition to industry certifications and licenses, newer forms of credentials are emerging that also generate opportunities for documenting informal learning. Digital badges are a new form of credential that records the achievement of sets of competencies through online activities (Young, 2012a, 2012b). Given their recent emergence, even less is known about their incidence or their potential effect on learners.

3. Workplace Rewards

Apart from translating informal learning into credit toward an educational credential (as with PLA) or into an industry certification or license, informal learning may also be recognized through structures already existing in the workplace. Specifically, some employers have established internal labor markets or groups of related jobs within their organization, enabling workers to progress through their career building using prior skills and knowledge (Althauser,

1989; Rosenfeld, 1992). Such markets occur only in an occupation in which a worker can advance within an organization. Although internal labor markets offer the promise of advancement, this type of institutional arrangement is increasingly less common in today's economy with its marked shift towards greater flexibility in employment arrangements (Cappelli, 1999; Kalleberg, 2003). Nonetheless, informal learning may still play an important role in the advancement of workers through internal labor markets where they still exist. If advancement cannot occur within the same organization, the skills gained through informal learning may help workers advance in other organizations.

Aside from career advancement, workplace learning provides several direct effects on the job benefits. Some research documents gains in productivity from informal learning. For example, Pells, Steel, and Cox (2004) note that industry training through experiential learning leads workers to be 5 to 20 percent more productive than they would otherwise be. Similarly, Konings and Vanormelingen (2010) find that the returns in productivity for a trained worker are 23 percent and that skilled workers are more likely to advance and have wage gains. In addition to gains in productivity, workers may earn salary increases for the skills and knowledge developed through informal learning. For example, Hansson (2008) finds "overwhelming" evidence that on-the-job training results in positive benefits, including significant wage returns. Likewise, a review of training programs (many of which include informal learning) demonstrate their effect on earnings (Greenstone & Looney, 2011).

4. Learn and Earn Models

Another approach for linking learning that occurs at work to formal educational achievement is via the integration of these approaches, a "learn-and-earn" approach. Learn and earn programs are defined as partnerships between postsecondary educational institutions and employers who provide opportunities for adults to attend college while employed (Business-Higher Education Forum, 2011). These programs take various forms, ranging from internships, co-ops, and apprenticeships to work study programs, career and technical education, and professional science master's programs (Business-Higher Education Forum, 2011).

Studies demonstrate that employees benefit from learn and earn programs by acquiring specific knowledge and skills while maintaining employment. Career oriented models (e.g., a program focused on science, technology, engineering, or mathematics) provide strong evidence of academic rigor and relevant training (Gardner & Bartkus, 2010). Employers benefit from these programs because they can use the programs' availability to attract and retain appropriately skilled workers, which can lead to the efficient expansion of the organization and increase employee productivity (Gardner & Bartkus, 2010).

As with any approach, the learn and earn model faces several pressing challenges but also opportunities to address them. Gardner and Bartkus (2010) argue that too much bureaucracy, for example, can limit the program's ability to be entrepreneurial, which could hinder the program's overall success. Allowing for diverse and flexible governance of such programs can

eliminate this challenge. Moreover, experts argue for the need for both greater collaborations between the business community and educational institutions and for increased publicity of such partnerships. Aligning government and non-government organizations' diverse agendas also challenges the strategic alignment among stakeholders. Finally, the lack of funding to attract and retain students is another important challenge to the success of learn and earn models. Given the lack of understanding of programmatic effectiveness, Gardner and Bartkus (2010) suggest that companies should report their programs' success and that schools need to monitor the labor market to identify and respond to emerging trends.

Informal learning occurs when a need arises, when new knowledge and skills are practiced and used to improve performance, and when learning is recognized and the individual reflects on the experience (Dale & Bell, 1999). Learn and earn models bring informal learning experiences in the workplace together with formal learning practices. They help integrate a liberal arts and vocational-technical curriculum in a way that better prepares learners for the current economy's needs (Schurman& Soares, 2010). Part of this process entails providing structures to link informal learning with formal learning. For example, LinkedLearning programs in California and other states bring together work-based learning experiences and formalized learning in technical skills and broad academic areas. Researchers have discovered positive outcomes stemming from linkages built among various types of learning, particularly among students from disadvantaged backgrounds (Forbes, 2011).

C. Implications and Remaining Questions

Based on this extensive review, it is clear that a great deal of learning occurs outside of formal education. It happens in many locations—at school, work, home, and in the community—and in many ways with various roles performed by the instructor versus the learner in directing the learning and through an array of sources of content—from a structured curriculum to contextually emerging topics and issues. The degree to which the learner seeks out the learning also varies. Recognizing the multiplicity of ways that learning can occur is essential to developing a fuller understanding of the role learning plays in promoting economic and life success. This recognition of the full continuum of learning reveals new possibilities in promoting learning—by encouraging it where it occurs. The continuum of learning offers many specific opportunities for learning, each with particular strengths and weaknesses. By understanding the strengths and weaknesses of these opportunities, it would be possible to harness their contributions to learning, promoting their use, and building on their strengths.

However, as this review notes, the context of informal learning like formal learning contains many barriers related to access and equity. Most salient is the fact that learning begets learning. As such, those with greater educational attainment are more readily able to partake in and benefit from informal learning than are those who are less educated. In addition, within the organizational context, sometimes tensions between the goals of the individual learner and the goals of the organization emerge. Any program that seeks to promote the strengths of informal

learning must be mindful of the implications for equity embedded in these types of learning opportunities.

Although many of these learning opportunities occur in different contexts, across different times and places, opportunities do exist to bring them together and to create links between learning experiences in ways that may enhance overall learning. For example, formal learning institutions may continue to develop strategies to integrate informal learning experiences through work-based learning opportunities that are part of formal credentialed programs. Or these institutions may develop competency-based models of instruction that include hands-on experiences that are common in everyday informal learning but are guided by and linked to the structures of a formal curriculum. Informal learning can help guide the way formal learning is conducted, and formal learning can help guide and structure the learning that occurs in informal settings.

Informal learning on its own has value that can and should be recognized in current discussions on how to promote workforce skill development. Learning in the workplace, in particular, offers an expansive opportunity to effect change in the lives of numerous workers in tangible ways. Attending to workplace structures and supports that promote informal learning can enhance worker productivity and satisfaction. Where learners are interested in advancing their careers, these learning opportunities can create pathways for advancement, particularly when properly recognized and documented—through internal labor markets and external credentials that document skill attainment. Both strategies are important—the internal labor market assists immediate progression and in some cases may lead to occupational advancement and greater job experience that could then lead to career advancement even at other firms. Providing credentials for informal learning is an important strategy for helping learners document their learning and translate it into long-term advancement in the labor market. However, careful thought is necessary to ensure that credentials in fact promote the recognition and valuation of informal learning in a way that most benefits the learner and the workforce.

Based on this overview of informal learning, several questions remain unanswered. These questions center around two key questions: (1) How can the measurement of informal learning be improved? (2) How can the practice of informal learning be enhanced? We discuss these two sets of questions in further detail as we conclude this paper.

Improving the Measurement of Informal Learning

Although some surveys exist to measure informal learning, in the United States, these have been conducted infrequently. With current efforts underway to conduct surveys, more information will be available on the incidence of informal learning. Care must be taken to attempt to ensure these efforts capture the full range of informal learning experiences. This becomes increasingly difficult with everyday informal learning. Furthermore, beyond measuring the incidence of informal learning, measuring the effects of informal learning on learners' short-term and long-term economic success along with the effects on employers and

the economy is essential to guiding efforts to promote informal learning. Through efforts to better understand the effects of informal learning, metrics for success can be developed to more effectively communicate the outcomes of informal learning. These metrics may also be examined for their relevance to formal learning contexts as these change and adopt practices from the informal learning context.

Enhancing the Impact of Informal Learning

Given what is known about how informal learning occurs, several questions arise about how it can be enhanced. First, the interaction between formal and informal learning is an area ripe for attention to understand how these types of learning can be brought together and more fully integrated to enhance overall learning. Research should examine how informal learning can expand the learning that occurs in formal settings and how formal learning may provide structures to increase informal learning's quality without losing informal learning's unique and valuable aspects. Some models exist for blending formal and informal learning, particularly through work-based learning approaches, and more attention should be devoted to understanding the most effective models' practices.

Issues of access and equity are of critical concern to all learning, including informal learning. Given that informal learning is of growing importance, attention should be devoted to understanding the supports that needed to help disadvantaged learners access informal learning opportunities and the most effective ways to provide these supports. Furthermore, in the workplace context, research is essential to understand the ways workplaces can be restructured to promote greater opportunities for informal learning and to provide mechanisms to document learning and translate it into value. Finally, given the rapidly changing developments in technology, a better understanding of its effect on disadvantaged learners will provide important knowledge to ensure equity in informal learning opportunities.

The question of how to translate informal learning into value is a crucial question in need of additional consideration. If and under what circumstances informal learning should be documented and translated into formal educational credentials or alternative credentials is an open question. Although learners may benefit from the formal credential, without care, this strategy could also add confusion to the already crowded credentialing landscape or lead to credential inflation. Additional research should examine in detail the outcomes of current processes to translate informal learning into value to understand their trade-offs and the benefits they ultimately confer to the learner, the employer, and society. Mechanisms to promote the value of informal learning through workplace rewards and/or learn and earn models need further examination to identify incentives and strategies that promote the expansion of these practices.

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APPENDIX: METHODOLOGY

To manage the breadth of scholarship on the topic of informal learning, we employed a systematic approach to searching for relevant literature. We examined literature including peer-reviewed publications, government, think tank or foundation reports, and books, including handbooks (i.e., how-to guides), with priority given to publications that provide comprehensive reviews of the literature and scholarship produced in the United States.

Databases

We used several electronic databases to search for relevant literature, including Articles+, Journal Storage (JSTOR), and Education Resources Information Center (ERIC)/Elton B. Stevens Company (EBSCO). Articles+ searches for journal, magazine, newspaper articles, book chapters, conference papers, dissertations, and reviews from hundreds of library databases, including Academic Search Premier, JSTOR, Science Direct, Web of Science, and over 40,000 journals published by companies, including Wiley, Springer, Elsevier, and Oxford University Press. We conducted additional cross-checking searches directly though ERIC/EBSCO and JSTOR. In some cases, we also used Google Scholar to verify that key terms had been thoroughly searched. Finally, we identified additional relevant sources from a close reading of the initial articles identified.

Time Frame

In general, we reviewed scholarship published within the last 10 years (from 2005 to the present). There are two major exceptions to this rule: 1) We did not place any time restrictions on scholarship addressing learning theories that we identified as being paradigmatic to an understanding of informal learning (e.g., John Dewey's learning by doing theory), although most of these theories date back to no earlier than 1990. 2) We expanded our search on empirical research on work-based learning to encompass the last 20 years (from 1995 onward).

Inclusion/Exclusion criteria

We searched 50 terms. We reviewed all publications where the key term appeared anywhere in the text. When such searching produced several thousand results, we limited the search to include publications where the key term appeared either in the title of the publication or in the abstract.

Using the methods outlined here, we identified over 600 publications related to informal learning. Of the scholarship cited, there are numerous disciplinary fields represented in this project; prominent among these are business (including human resources), education, and health. Although every effort was made to identify all the relevant scholarship, it is possible that some scholarship was inadvertently excluded due to oversight or inaccessibility.

Keywords Searched:

Action learning
Adult basic education
Adult remedial education
AmeriCorps learning
Apprenticeship
Civic learning
Cooperative learning
Coaching
Coaction learning
Collaborative learning
Collective learning
Community based learning
Community education
Continuing education
Cooperative education
Cooperative learning
Education badges
Experiential learning
Extracurricular activities
Externship
Family learning
Gaming and learning
Home economics education
Incumbent worker training
Industry certification
Industry license
Informal adult learning
Internship
Job shadowing
Learning at work
Learning organizations
Lifelong learning
Mentorship
Military learning
Non-credit education
Online learning
On-the-job training
Prior learning assessment
Professional development
Professional learning communities
Relational learning (including barriers, access, and disadvantaged)

Science informal learning
Self-directed learning (including barriers, access, and disadvantaged)
Service learning
Social justice and learning
Social learning
Team learning
Union Training
Volunteerism
Workplace learning