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ORGANIZATIONAL TRAINING AND PERFORMANCE

Facilitating Informal Learning at Work

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Abstract
While the majority of workplace learning is informal, most organizational resources devoted to learning are allocated to more formal means, such as training. The purpose of this study was to investigate how instructional designers facilitate informal learning in the workplace. Three hundred eighty-five practitioners completed an online survey developed to measure how informal workplace learning is facilitated. In addition, 20 survey respondents participated in follow-up interviews. Findings revealed that practitioners employ a variety of methods to facilitate informal workplace learning. Sharing knowledge, materials, and resources emerged as the most common approach. As proponents of learning, instructional designers, as well as their managers and clients, may leverage the findings of this study to facilitate informal workplace learning, thus increasing performance.

Keywords Informal learning · Professional development · Workplace learning

Professionals engaged in work continuously confront situations and tasks that require the acquisition of new knowledge and skills. Due to the pervasiveness of learning throughout the workplace, many believe it is key to job performance (Barnett 1999; Boud and Middleton 2003; Eraut 2004). Both formal and informal learning occur in the workplace (Brockman and Dirkx 2006; Choi and Jacobs 2011; Ellinger 2005). Frequently required, devised, and implemented by organizations, formal training programs involve structured and intentional learning. Informal learning, however, entails individuals seeking and engaging in learner-directed, unstructured, and often spontaneous activities to gain tacit or explicit knowledge and experience (Dennen and Wang 2002; Jacobs and Park 2009; Marsick and Volpe 1999).

Informal learning can occur in a variety of ways in the workplace, and scholars often discuss it through lists of activities accomplished by the learner. After conducting a series of surveys and case studies with K–12 teachers (Lohman 2000, 2003; Lohman and Woolf 2001), Lohman (2005) established eight types of informal workplace learning activities. Additionally, Watkins and Cervero (2000) investigated the workplace learning of certified public accountants (CPAs) and assembled a comprehensive list of 31 workplace learning opportunities. Later, Noe et al. (2013) compiled a list of informal workplace learning activities of restaurant managers to measure the influence of individual differences on informal learning. More recently, the eLearning Guild (2014) invited members to complete their Informal Learning in the Workplace Survey, and asked respondents "What does informal learning look like inside your organization?" Their online instrument displayed a list of 32 informal learning activities. Table 1 compiles these lists of informal workplace learning activities, and commonalities across these lists include collaboration and communication between individuals and solitary information seeking.

Informal learning offers multiple workplace benefits. Professionals can develop expertise in relevant tasks, and organizations may cultivate a sound workforce (Rothwell and Kazanas 2008; van Rijn et al. 2013). Informal workplace learning may not require time away from work or extra travel and registration fees. Instead, professionals often engage in informal learning by seamlessly undertaking it while simultaneously executing work tasks (Hoffman 2005). A graphic designer gaining project management insight from reviewing his team's email thread, or a nurse picking up time-saving tips from working side-by-side with her charge nurse, show how

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Table 1 Lists of informal learning activities identified from recent literature

Author(s)	Informal workplace learning activities
Lohman (2005)	• Talking with others • Collaborating with others • Observing others • Sharing materials and resources with others • Searching the Internet • Scanning professional magazines and journals • Engaging in trial and error • Reflecting on one's actions (p. 508)
Watkins and Cervero (2000)	• A library with professional journals and books • Membership dues to support networking with other CPAs around professional practice issues and emerging trends affecting the profession • Formal mentoring from supervisors on professional and career development • Performance planning – getting performance expectations from supervisors based on strategic organizational goals • Performance planning – getting performance expectations from clients • Performance planning – setting performance objectives for personal development needs • Computerized information bases to support your work • Job aids, checklists, tools, etc. from peers, supervisor • Structured critiquing sessions on one's own or others' work with peers or supervisors • Observing supervisor in the process of performing tasks • Observing peers in the process of performing tasks • Seeing models of "best practice" audits, other finished products • Working with supervisor on joint tasks • Working with peers on joint tasks • Working on new projects, working with new clients • Getting performance feedback from supervisors • Getting performance feedback from peers • Getting performance feedback from clients • Sharing "war stories" or other problematic situations with peers or supervisors • Getting tips on how to complete a task from peers or supervisors • Problem solving with peers or supervisors • Reviewing errors or unexpected occurrences with peers or supervisors • Reviewing the development or history of task procedures or conditions • Identifying and discussing best practices used in other organizations • Discussing quality improvement suggestions with peers, supervisors • Reviewing significant trends, new tax laws, and other issues which may affect professional practice with peers, supervisors (p. 190–191)
Noe et al. (2013)	• Learning from oneself - Reflecting about how to improve my performance - Experimenting with new ways of performing my work - Using trial and error strategies to learn and better perform • Learning from others - Interacting with a mentor - Interacting with my supervisors - Interacting with my peers • Learning from non-interpersonal sources - Reading professional magazines and vendor publications - Searching the Internet for job relevant information - Reading management books (p. 331)
The eLearning Guild (2014)	• Attending conferences • Coaching by non-specialist coaches • Collaboration with colleagues • Communities of practice • Conversations with colleagues/co-workers • Discussion with supervisor/manager • Individual or team blogging • Individual or team reflective practice (e.g., working out loud, blogging about learning experiences, sharing experiences on enterprise social network) • Informal mentoring • Knowledge sharing • Observations • Peer to peer coaching

Table 1 (continued)

Author(s)	Informal workplace learning activities
	• Personal learning networks (PLN) • Project reviews (e.g., working out loud; sharing process and results) • Reading blogs and feeds • Reading manuals and/or reference materials • Reading professional journals and/or magazines • Recording and sharing experiences • Replacing formal learning entirely with informal approaches (e.g., building a community of practice instead of an online course) • Resource sharing • Self-organized individual learning • Social networking • Storytelling • Trial and error • Using the Web • Using informal approaches within a formal course or for pre- or post-training (e.g., having a live Twitter chat as part of the program) • Watching videos • Water cooler encounters • Work/job shadowing • Work observations • Working out loud (e.g., explaining how you did something)

informal learning can be embedded within daily work tasks. Such natural incorporation within a work routine serves to ensure that the resultant learning is meaningful and more permanent, whereas formal training may not guarantee transfer to work (Billet 1999; Brockman and Dirkx 2006; Burns et al. 2005; Garrick 1998).

The discipline of instructional design focuses on facilitating learning and supporting the performance of individuals and organizations. While many types of interventions have been proposed, the majority of organizational resources devoted to learning are allocated to more formal means such as training (Ellinger 2005; Lohman 2000; Marsick and Watkins 2001). This is in contrast to findings that the preponderance of learning that occurs in the workplace is informal in nature (Ellinger 2005; Lohman 2000; Marsick and Watkins 2001). Informal learning is so prevalent in the workplace that the reported ratio of formal to informal learning highly favors informal, sometimes as steeply at 10 to 90% (Cross 2013; Lohman 2003; Marsick and Watkins 1990).

Despite the wide spread use of informal workplace learning, the connection between instructional design and informal learning has not received much attention from researchers in the field. A few studies have examined how instructional design practitioners utilize informal learning for their own workplace learning. For example, Berg and Chyung (2008) surveyed professionals working in instructional design, performance technology, organizational development, training, and e-learning. They found that personal characteristics such as age, educational background, and motivation are related to the types of informal learning activities that practitioners engage in. In addition, Yanchar and Hawkley (2014) conducted in-depth interviews with six members of an instructional design team and found that each teammate reported continual learning through work tasks. The researchers proposed that "design itself can be thought of as a specialized type of informal learning" (p. 27). These two studies examined the informal strategies used by instructional design professionals for their own learning, not how they use it to facilitate the learning of others within their organizations.

Given the prevalence of informal workplace learning, it is important to understand how instructional designers can support it. Determining best practices for facilitating informal learning in the workplace would benefit a range of stakeholders, including instructional designers, their managers and, their clients. The purpose of the current study was to investigate how instructional designers facilitate informal learning in the workplace. Two research questions guided this study:

(1) What types of informal learning activities do instructional designers facilitate in their organizations?
(2) How do instructional designers facilitate informal learning in their organizations?

Method

Research Design

This study utilized survey research to gather information regarding how instructional designers facilitate informal

workplace learning. Because the intent of the study was to examine trends, characteristics, and beliefs of a group, a survey design was appropriate (Creswell 2009). This two-part study began with 385 instructional designers completing an electronic survey, with follow-up telephone interviews conducted with a sub-group of 20 participants.

Participants

Survey respondents were 385 instructional designers. The majority were female (63%) with a master's degree in the instructional design field (59%). Many worked at an educational institution (52%), with others working in settings such as business and industry (16%), consulting (10%), healthcare (5%), government (5%), or the military (3%). Years of work experience varied; 43% had more than 10 years of experience, 23% had from 6 to 10 years, and 34% had less than 5 years working in the instructional design profession. Furthermore, 20 instructional designers volunteered to participate in follow-up interviews. Interviewees were intentionally selected to provide a range among demographic categories (see Table 2).

Instrumentation

Survey For the first phase of data collection, an electronic survey was built within the Qualtrics© online system. The survey form consisted of two sections: demographics and informal learning. The demographic portion addressed participant characteristics (gender, age, level of education, years of professional experience) and the type of organization where they worked.

The informal learning portion of the survey entailed a list of 20 informal workplace learning activities synthesized from the literature (eLearning Guild 2014; Lohman 2005; Noe et al. 2013; Watkins and Cervero 2000). It is intended to thoroughly and succinctly represent the various facets of published lists of informal learning activities. This list appeared in a matrix (see Table 3). Reading down the list of informal learning activities, respondents were asked to identify those activities they facilitate within their organization.

Following the matrix were two open-ended questions. The first item asked respondents to "describe how you, as an instructional design practitioner, facilitate informal learning within your organization to support learning and performance." Despite the potential of the informal learning activities list biasing these free responses, this order of survey items emerged from pilot tests as most effective in eliciting ideas from respondents. The final item solicited volunteers for follow-up interviews.

Interview Protocol The purpose of the follow-up interviews was to delve deeper into informal workplace learning. Therefore, data collected via the online survey informed the protocol for the semi-structured interviews. After reviewing the results of the survey matrix and coding the open-ended survey responses, key findings formed a structure for the script. For example, over 90% of survey respondents reported that they facilitate the *sharing of knowledge, materials, and resources.* Therefore, each interviewee was asked how they facilitate this informal learning activity.

Procedures

Pilot Tests Prior to data collection, the online survey was piloted with 10 instructional designers who either belonged to a professional organization in the field and/or possessed an academic degree in instructional design. During one-on-one conversations, these 10 individuals were asked to access the electronic survey; describe their thoughts while they completed it; and provide detailed feedback regarding the instructions, informational text, and items. After each meeting, necessary changes were made to the survey form, which allowed the subsequent practitioner to consider the most recent modifications.

Survey Data Collection Data collection occurred in two rounds, with the electronic survey acting as a precursor to the interviews. Three approaches achieved contact with instructional designers: (a) professional organizations with which they currently hold memberships, (b) their former

Table 2 Demographic information for the 20 interviewees

Years of professional experience		Primary job role		Type of organization	
1–5 years	7	Consultant	1	Association/Non-profit	1
6–10 years	7	Designer	3	Consulting	2
10–20 years	2	Developer	1	Educational Institution	7
More than 20 years	4	Human Performance Improvement Specialist	2	Financial Services/Insurance	2
		Manager	9	Government	2
		Project Lead Designer	3	Manufacturing	1
		Trainer	1	Retail	1
				Telecommunications	2
				Transportation	2

Table 3 List of informal learning activities from survey

- Read professional magazines and reference materials
- Use job aids, checklists, tools, videos, etc.
- Use computerized information bases (e.g., EPSS, database)
- Search the Internet for job-relevant information
- Use social media (e.g., engage with others, read blogs/feeds, blog as an individual/team)
- Share materials, resources, and knowledge
- Establish/contribute to communities of practice
- Attend/present at conferences
- Participate in mentoring and/or coaching
- Get performance expectations from supervisors/clients and/or set personal performance expectations/objectives
- Interact with supervisors/peers (e.g., chatting over the cubicle, water cooler encounters)
- Participate in work/job shadowing (e.g., shadow someone/being shadowed)
- Observe supervisors/peers in the process of performing work tasks
- See models of best practice/finished products
- Work with supervisors/peers (e.g., collaborate, problem solve, explore solutions to real problems, decide on actions)
- Engage in trial and error/experimenting
- Get tips from supervisors/peers
- Get/provide performance feedback with supervisors/peers/clients (e.g., critiquing sessions)
- Review (as an individual or team) significant trends, new regulations, and other issues which may affect professional practice
- Reflect as an individual or team (e.g., reflect on experiences/about how to improve performance, work out loud, blog/share experiences)

academic programs, and (c) professional development social media groups. First, three professional organizations were contacted: Association for Educational Communications and Technology (AECT), Association for Talent Development (ATD), and International Society for Performance Improvement (ISPI). Second, 212 academic programs listed in the Educational Media and Technology Yearbook (Orey et al. 2013) were contacted. Administrators of the professional organizations dispersed the request and survey link to their members, and agreeable academic program contacts shared with their alumni networks. Third, the Instructional Design & E-Learning Professionals' Group on LinkedIn served as a platform to publicize the study invitation. The online survey link remained open for two-and-a-half months. After 3 weeks of data collection, the contacts for non-responding professional organizations and academic programs received follow-up requests.

Interview Procedures After the electronic survey closed, all data were downloaded into an Excel document and reviewed in preparation for the interviews. Of the 385 survey respondents, 95 individuals volunteered to participate in follow-up interviews. Because the goal of the interviews was to delve deeper into the topic of informal workplace learning from the perspective of instructional designers, 20 interviewees were selected strategically to yield a diverse group that was as representative of the population as possible. The volunteers were first organized by years of professional experience and then by type of organization, primary job role, and number of employees in the organization. The purpose of this categorization was to identify a group of 20 individuals who represented a range of professionals in the instructional design field. Individual emails were sent to schedule each interview. This first round of invitations resulted in 10 meetings being scheduled, and therefore the selection procedures described above were repeated until a total of 20 interviews were scheduled and confirmed.

The 20 interviews consisted of one-on-one telephone conversations, guided by an interview protocol. When responding to the prompts of the interview script, interviewees described their organization's physical workspace, their main tasks within their positions, how they facilitate informal learning, and how they see their organization facilitate informal learning.

Data Analyses

Both quantitative and qualitative data were collected so multiple analysis techniques were used. The quantitative data pertaining to survey demographics and the responses to the survey matrix were analyzed and frequencies were reported. Qualitative data, such as open-ended survey responses and recorded interviews, were transcribed and saved in a textual, electronic format for coding. Analysis procedures included multiple rounds of open and axial coding (Corbin and Strauss 1998; Creswell 2009). Due to the timing of the two sequential data collection phases, the open-ended survey responses were analyzed first.

Responses to the open-ended survey item were uploaded into the NVivo for Mac software and analyzed separately. All individual responses were read once through in entirety with no coding, and then three rounds of coding ensued. For example, for the first coding round, 259 open-ended survey responses were imported into NVivo and each response was read with this question in mind: How do instructional designers facilitate informal learning within their organization? Responses were highlighted and an open code was created if one did not exist already. Next, all open codes were evaluated for relevancy and redundancy, at which point codes were organized. At this stage, some axial codes were created to form a structure within the coding scheme. In the second round of coding, the researcher possessed more familiarity with the overall data set, as well as the coding scheme, which allowed codes to be more appropriately applied to participant responses. A third round of coding allowed the researcher to ensure all data were organized within the open and axial codes, as well as confirm the structure of the scheme.

To minimize bias from a solitary researcher, a colleague coded a sample of responses from the open-ended survey items. After a training session to familiarize him with the coding scheme, the coder read through 20

randomly selected open-ended survey responses and applied the codes provided by the researcher who then compared the coder's selections with her own. The researcher and coder independently selected and applied the same codes for 16 of the 20 survey responses, indicating 80% percent agreement between coders (Creswell 2009).

After all open-ended survey responses had been coded and a scheme developed and verified, the interview script was finalized and interviews with instructional designers commenced. Following each interview, the recording was transcribed, the Word document uploaded into NVivo, and each interview transcript was analyzed against the coding scheme.

Results

This study explored how instructional designers facilitate informal learning in the workplace. Findings related to the two research questions that guided this study are provided below.

What types of informal learning activities do instructional designers facilitate in their workplace? The online survey listed 20 informal learning activities; respondents selected those activities they facilitate within their workplace. Findings revealed that 18 of the 20 informal learning activities were selected by more than 50% of respondents (see Table 4). The two most common types of informal learning were *share materials, resources, and knowledge* (92%, $n = 353$) and *use job aids, checklists, tools, videos, etc.* (88%, $n = 337$). The two least common types of informal learning were *observe supervisors or peers in the process of performing work tasks* (44%, $n = 169$) and *participate in work or job shadowing* (32%, $n = 123$).

How do instructional designers facilitate informal learning in their workplace? Of the 385 survey respondents, 259 elaborated on how they facilitate informal learning within their workplace. Furthermore, 20 interviewees provided data to answer this question. Findings indicated that practitioners employ various methods to facilitate informal learning. The four most common approaches were (1) *share knowledge*; (2) *chat and ask questions*; (3) *encourage and promote informal learning*; and (4) *create and curate materials and learning objects* (see Table 5).

Sharing Knowledge The majority of practitioners reported that sharing knowledge is a common method of facilitating informal learning. More specifically, they described their experiences of sharing knowledge with others in terms of what they shared (e.g., literature and articles, resources and materials, information and ideas, best practices) and how they shared (e.g., via email, meetings, word of mouth, social media). For example, one specialist in the transportation industry described her team's practice of sharing with each other and said, "We sometimes will just email each other, or share it within the WhatsApp group, or the group on the corporate social media platform. Sometimes we share videos, articles,. .. interesting images." Additionally, many instructional designers also discussed their expectations and motivation for sharing knowledge. Regarding a personal habit of sharing materials, one designer at an educational institution stated:

> I share resources and ideas with various members of my team strategically so that as team members have time, they can access the resources and extend their knowledge. . . . My objective is to create a workplace environment for my team in which information is rich, learning is encouraged, and time is spent processing each other's learning.

Chatting and Asking Questions Many practitioners described their roles within these exchanges as both the knowledge sharer and the knowledge gainer, sometimes acting as both within an interaction. An instructional designer at a vocational high school described his open communication with two other designers as:

> The community we have between all of us, it's just this one thing leads to the next thing which leads to the next thing which leads to the next thing. And by the time we've gone through five things, we're not even talking about what we were talking about in the first place.

He explained that through their continuous conversations at work, he constantly learns from them and vice versa. These interactions also tended to be spontaneous in nature, rather than planned conversations, as exemplified by a comment from a project lead designer at a university:

> Well I find some of the most interesting and useful things that I encounter incidentally or accidentally, you just happen to meet somebody by chance, and talk something over, and it just so happens that they're dealing with an instructional issue that interests me, or they make a suggestion for a project that hadn't occurred to me.

The settings of these exchanges ranged from brief conversations en route to a communal printer to calling out a question to an office room of people to making small talk during a company social event. One manager, who oversees training at a national retail call center, said of her team of learning specialists:

> There's a lot of "drop by the desk and chat about, you know, I'm working on this, how do YOU do it?" Because they all support different clients. And they all

Table 4 Breakdown of survey responses for the types of informal learning facilitated by instructional designers

What types of informal learning activities do practitioners facilitate in their workplace?	Frequency[a]	Percent
Share materials, resources, and knowledge	353	92%
Use job aids, checklists, tools, videos, etc.	337	88%
Interact with supervisors/peers	263	68%
Get tips from supervisors/peers	263	68%
Search the Internet for job-relevant information	257	67%
Use computerized information databases	256	66%
Participate in mentoring and/or coaching	252	65%
Reflect as an individual or team	250	65%
Read professional magazines and reference materials	246	64%
Work with supervisors/peers	242	63%
Attend/present at conferences	238	62%
See models of best practice/finished products	237	62%
Use social media	234	61%
Establish/contribute to communities of practice	226	59%
Get/provide performance feedback with supervisors/peers/clients	222	58%
Engage in trial and error/experimenting	208	54%
Get performance expectations from supervisors/clients	205	53%
Review significant trends, new regulations, and other issues which may affect professional practice	204	53%
Observe supervisors/peers in the process of performing work tasks	169	44%
Participate in work/job shadowing	123	32%

[a] The total number of survey respondents was 385

have different contractual needs, and so there's a lot of casual "stop by" kind of conversations.

Encouraging or Promoting Informal Learning Practitioners described facilitating specific informal learning activities by encouraging or promoting it. Many respondents discussed how they point others to available resources, such as shared repositories, libraries, websites, or webinars, in an effort to position others to be self-sufficient. This practice is exemplified in the comment from a manager at a large consulting firm. While discussing her organization's approach to making knowledge accessible to employees, she described the various levels of communication she regularly bridges, spanning project management teams, clients, her direct coaches and mentees, and audiences of conference calls:

> So as a manager, we make sure it's available . . . and I personally then share and remind them all of the places that I am aware of where they can access any of those materials or videos or whatever so that we're making sure that we're socializing that and making that public, so that we can raise everyone's awareness of what's available to them.

Other instructional designers embolden peers and "encourage people to get in and try something. Just get in and click around, because you'll learn a lot more from that than you will from us." A specialist with a technology company whose role is mainly content curation warned that compiling, organizing, and sharing information is not enough to ensure success:

Table 5 Breakdown of themes for how instructional designers facilitate informal learning

How do practitioners facilitate informal learning in their workplace?	Survey		Interview	
	Frequency[a]	Percent	Frequency[b]	Percent
Share knowledge	85	33%	17	85%
Chat and ask questions	22	8%	15	75%
Encourage and promote informal learning	86	33%	13	65%
Create and curate materials and learning objects	55	21%	13	65%

[a] The total number of survey respondents was 259 for this open-ended item

[b] The total number of interviewees was 20

> We have to take a practical stance and not simply just be aware that informal learning is occurring and just throw some resources for it and let it go. We have to be actively engaged in the process and helping people use them more effectively, both for the relevance and more for the effectiveness of the content that we're sharing with them.

Create and Curate Materials and Learning Objects

Practitioners also create and curate materials in an effort to support their learners' and teams' informal learning. The materials and learning objects discussed included job aids, reference information, libraries, and archived webinars. A common goal for these development and curation efforts was to provide professionals with just-in-time information, often with the materials being stored in an internal or external online repository where professionals can quickly access specific information and continue their work tasks.

For example, an instructional support staff member at a university facilitated informal learning among faculty by taking it upon himself to create professional development materials. Of his efforts he stated:

> I've developed a website for our faculty that has about 35 articles that I've wrote over a two-year period about education research, best practices, on certain issues that instructors typically face, so I often refer them there . . . or they'll find it and they'll contact me if something is on their mind.

He explained that his intention was "deliberately to provide sort of evidence-based research findings about best teaching practices and learning in different contexts." Their group does not provide structured training sessions on those types of topics, so his archive of articles often "leads to informal emails or in-person conversations."

Discussion

The purpose of this study was to investigate informal learning in the workplace. Taken together, the survey and interview data create an overall picture of instructional designers' practices. By engaging in informal learning themselves through sharing knowledge and interacting with others, practitioners facilitate informal learning in their workplace. For example, when instructional designers email team members a link to an online article or talk with coworkers about a project in the hallway, they are initiating informal learning. Subsequently, this event becomes the impetus for the informal learning of others.

This explanation is supported by other researchers who have examined informal learning. For example, Baert and Govaerts (2012) reported that sharing ideas was a common method of workplace learning among members of a human resources team. Similarly, Lohman (2003) interviewed K–12 teachers attending professional development training and found that participants thought that the casual conversations between sessions were more beneficial than the formal training sessions. Further, Moore and Klein (2015) found similar patterns among instructional design and technology graduate students; a majority indicated that they frequently shared materials and resources with others and considered this informal learning activity to be useful.

The penchant of instructional designers for sharing knowledge may be due to the mutually beneficial nature of the action. For example, a practitioner may receive a useful resource from a colleague, and later reciprocate the professional favor. Ongoing two-way communication and help-giving may establish a rapport that builds an extended network of colleagues. Cultivating a diverse and competent community of practice is abetted by contributing to shared knowledge. Correspondingly, instructional designers may encourage and engage in the sharing of resources, knowledge, and ideas because they recognize the value of such practices. As learning and development professionals, they most likely acknowledge the value that employee sharing and help-giving present at both the individual and organizational levels.

Additionally, most survey respondents reported that they facilitated informal learning in their workplaces with the use of job aids and tools. When this is considered in tandem with the finding that a majority of interviewees facilitated informal learning by creating and curating materials, additional insight into practitioners' habits becomes apparent. When placed within the context of a busy workplace, rife with meetings, overlapping projects, and tight deadlines, an informal learning activity that helps professionals to stay on-task may be desirable. By creating and curating materials, practitioners facilitate the use of such just-in-time learning resources.

The use of reference materials to supplement performance and learning is well documented in the literature on workplace learning. Twidale (2005) recommended that computer programmers should utilize maps and crib sheets, both hardcopy and electronic, when learning to create webpages with new technology. Additionally, he recounted how novice programmers and developers learned from referring to spreadsheet templates that were created and provided by more experienced colleagues. Similarly, Brockman and Dirkx (2006) described the strategies employed by manufacturing machine operators to overcome problems and build knowledge while working. They found that machine operators often rely on materials such as job aids and checklists. Given the potential benefits of such just-in-time resources, instructional designers can contribute to the effectiveness of these materials.

The instructional designers who participated in the current study most likely acknowledged the benefits of job aids, checklists, and such tools for others, and thus created and curated materials. The overall goal of these efforts, of course, is to support learning and performance. Making just-in-time information and materials available will allow for professionals to retrieve and utilize knowledge mid-task. With instructional designers' expertise focused on learning and performance, it is not surprising that a high number of respondents indicated that they facilitated this informal learning activity.

Limitations

There are three limitations of this study. First, the instructional designers were volunteers. The fact that these individuals elected to participate, while others chose not to do so, may indicate characteristics unique to the study participants that are not shared by their non-participatory colleagues. Second, the survey's matrix may have influenced the data collected from the open-ended survey responses. That is, within the online survey form, the matrix, which listing informal learning activities, appeared immediately above a fill-in textbox. Respondents typing their answers may have provided comments that were biased by the content of the list. Although this could be viewed as the matrix prompting respondents to submit specific and accurate information, it is unknown what other ideas or topics respondents may have provided in the absence of the matrix. Third, the interviewees may not be fully representative of the total population of instructional designers, due to sampling procedures and availability of study participants. Regarding the selection of potential interviewees, those survey respondents who elected to participate in an interview were categorized and strategically selected. Therefore, the range and scope of study participants were not all-encompassing.

Implications

Informal learning is one of the many strategies within a practitioner's toolkit. Informal learning can be facilitated via cognizant, intentional efforts, as well as incidental, unintentional means. This intentional or unintentional facilitation may result from actions of instructional designers or their organizations. For example, instructional designers can intentionally recruit colleagues for lunch-and-learn events in an effort to facilitate informal learning, or directly design an instructional solution that includes a less-structured session intended to prompt informal learning. Additionally, instructional designers could unintentionally fall into conversation with a coworker in the hallway about a useful resource.

The findings of this study suggest how instructional designers can facilitate informal workplace learning. Instructional designers often face challenges such as overwhelming numbers of personnel to support, an unrealistic amount of content to cover, and limited time and budget for intervention design. In an effort to overcome these challenges, instructional design practitioners can facilitate informal learning in a number of ways, thus achieving their goal of improving performance.

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