A Comparative Analysis of the Informal Workplace Learning Experiences of Three Professional Groups

Margaret C. Lohman
Penn State University - Harrisburg

A survey was conducted to compare the informal workplace learning (IWL) experiences of three professional groups (information technologists, school teachers, and HRD professionals). Data analysis found that the three groups use interactive more than independent IWL activities. Five environmental factors inhibited engagement and nine personal characteristics enhanced engagement in IWL. Implications of these findings for theory, practice, and research in IWL are discussed.

Keywords: Informal Workplace Learning, Survey Research, Work Environment

Informal workplace learning (IWL) is an important way through which professionals develop their expertise. IWL refers to activities initiated by people in work settings that result in the development of their professional knowledge and skills (Cofer, 2000; Lohman, 2000). Recent studies have made important progress in developing greater understanding of the types of work-based activities associated with IWL as well as personal and contextual factors that tend to promote or inhibit participation in the IWL process (Boud & Middleton, 2003; Ellinger, 1999; Ellstrom, 2001; Kwakman, 2003). The degree to which specific personal and environmental characteristics influence participation in different types of IWL activities has also been examined (Lohman, 2000, 2003). For example, in a recent survey Lohman (2005) investigated the informal learning experiences of two professional groups, public school teachers and HRD professionals. The findings from this survey enhanced understandings of IWL among the two professional groups studied. However, a question remains regarding the degree to which the findings apply to other groups who, similar to teachers and HRD professionals, are experiencing high levels of job intensification.

Unquestionably, one such group is information technologists. Information technologists design, implement, and maintain computer systems that gather, manage, and analyze information used by organizations (*Professional Information Technology Classification Matrix*, 2004). The nature of this work continues to intensify in scope and complexity. A generally accepted belief is that job intensification concurrently increases the need to acquire new job knowledge and skills yet decreases the amount of time available for learning (Hargreaves, 1992). As a consequence, professionals experiencing high levels of job intensification, such as information technologists, rely heavily on IWL as a means of developing the knowledge and skills they need to perform their jobs. Therefore, an appropriate next step in the study of IWL is to examine the generalizability of the findings from the survey of teachers and HRD professionals by replicating it with information technologists.

Theoretical Framework: Factors Influencing Engagement in IWL Activities

The theoretical framework for this study was based on several models that identify IWL activities and characteristics of work environments and workers that influence engagement in those activities. These models have been based predominantly on theory and research of informal workplace learning, motivation, and job demand and stress.

In the model of Doornbos, Bolhuis, and Simons (2004), work-related learning is described as work-based activities related to handling novel, ambiguous work problems. This model identifies six work environment characteristics (autonomy, work pressure, support, task variation, interaction partner variety, and collegial availability) and four worker characteristics (social integration with managers, social integration with colleagues, experience of competence, and recognition of value of learning at work) as key to promoting work-related learning.

Similarly, van Woerkom, Nijhof, and Nieuwenhuis (2002) constructed a model of factors influencing critical reflective behavior at work. The model posits that eight work activities are associated with critical reflective behavior: reflection on oneself in relation to the job, learning from mistakes, vision sharing, challenging group think, asking for feedback, experimentation, sharing knowledge, and awareness of employability. Factors influencing participation in these work activities include 10 job characteristics (workload, alternation, autonomy, task obscurity, information, participation, cooperation, communication, coaching, organizational climate for learning) and 3 worker characteristics (motivation, self-efficacy, and variety of experience).

Empirical studies have been conducted to examine some aspects of these models. In a survey of 542 secondary teachers in the Netherlands, Kwakman (2003) found that four personal characteristics (professional attitudes, appraisals of feasibility of learning activities, appraisals of the meaningfulness of learning activities, loss of personal accomplishment), two task factors (work pressure and job variety) and two environmental factors (collegial support and intentional learning support) influenced participation in workplace learning activities. Similarly, in a survey of 742 educators, van Woerkom et al. (2002) examined the influence of job and individual characteristics on critical reflective working behavior. Of the thirteen characteristics studied, one was found to be most potent in relation to promoting critical reflective working behavior—self efficacy.

While empirical studies such as the aforementioned have focused on factors influencing participation in the IWL process in general, a series of studies by Lohman (2000, 2003, 2005) has examined the degree to which certain characteristics of workers and work environments influence participation in specific types of IWL activities. In a recent survey of the IWL experiences of public school teachers and HRD professionals, Lohman (2005) found that teachers rely to a greater extent than HRD professionals on interactive learning activities. Two environmental factors were found to frequently inhibit both professional groups from engaging in IWL activities, a lack of time and a lack of proximity to colleagues' work areas. Three additional environmental factors were found to inhibit HRD professionals—an unsupportive organizational culture, the inaccessibility of others, and the unwillingness of others to participate in informal learning activities. One additional environmental inhibitor was found for teachers—a lack of funds. Seven personal characteristics were found to enhance the motivation of both professional groups to engage in informal learning: initiative, self-efficacy, love of learning, interest in the profession, commitment to professional development, a nurturing personality, and an outgoing personality.

The purpose of the current study was to examine the generalizability of the findings from the IWL survey of teachers and HRD professionals by replicating it with information technologists. Three research questions were addressed: (1) Do the IWL activities of information technologists differ from those used by teachers and HRD professionals? (2) Do the environmental factors that inhibit information technologists from engaging in IWL differ from those that inhibit teachers and HRD professionals? (3) Do the personal characteristics that motivate information technologists to engage in IWL differ from those that motivate teachers and HRD professionals?

Methods

Subject Selection

The U.S. membership list of the Computer Society of the Institute of Electrical and Electronics Engineers (IEEE) was used to select participants for the current study. IEEE is the world's largest professional association of information technologists. The mission of the Computer Society of IEEE is to advancing the theory, practice, and application of computer and information processing technology. At the time of the study, there were approximately 55,000 information technology professionals in the United States with active memberships in the Computer Society of IEEE. Six hundred members of the Computer Society were randomly selected from IEEE's database to participate in this study. Two mailings of the survey were administered, producing a total of 143 completed surveys for a response rate of 24.1 percent. Information technologists were compared with two other professional groups, public school teachers and HRD professionals. These two groups were surveyed previously using procedures similar to those used in the current study (Lohman, 2005). The response rates for teachers and HRD professionals were 27.7 percent (n=166) and 25.3 percent (n=152), respectively.

As shown in Table 1, the three groups differed significantly on the five demographic characteristics studied. HRD professionals had the most years of work experience, followed by information technologists, and then teachers. The number of years that information technologists worked for their current employer was significantly lower than HRD professionals and teachers. The teacher group was comprised mostly of females, the information technology group mostly of males, and the HRD group was fairly evenly split between males and females. The educational level of teachers was significantly lower than HRD professionals. The highest mean age was found among HRD professionals, followed by information technologists, and then teachers.

Instrumentation

The current study used the IWL survey that was used in a recent survey of teachers and HRD professionals (Lohman, 2005). The survey instrument contained 19 items grouped within 4 main sections. The first section asked respondents to rate the frequency with which they use eight IWL activities: talk with others, collaborate with others, observe others, share materials and resources with others, search the Internet, scan professional magazines and journals, trial and error, and reflect on your actions. The second section asked respondents to rate the frequency with which five aspects of work environments (time, proximity to colleague's work areas, access to computer technology, monetary rewards, and recognition) inhibit their engagement in the eight previously identified IWL activities. The

Table 1. *Demographic Characteristics of Survey Respondents in Three Professional Groups.*

Demographic Characteristics		Professional Groups					
		Information Techs		Teachers		HRD Professionals	
		n	%	n	%	n	%
Total Years of Work Experience	0 - 5	16	11.3	28	16.9	4	2.6
	6 - 10	14	9.9	30	18.1	12	7.9
	11 - 15	18	12.7	25	15.1	13	8.6
	16 - 20	19	13.4	22	13.3	26	17.1
	> 20	75	52.7	61	36.6	97	63.8
	Total	142	100.0	166	100.0	152	100.0
Years Worked for Current Employer	0 - 5	72	50.3	40	24.1	44	29.1
	6 - 10	27	18.9	39	23.4	38	25.3
	11 - 15	18	12.6	26	15.7	20	13.2
	16 - 20	11	7.7	21	12.7	20	13.2
	> 20	15	10.5	40	24.1	29	19.2
	Total	143	100.0	166	100.0	151	100.0
Gender	Male	128	89.5	28	16.9	71	47.0
	Female	15	10.5	138	83.1	80	53.0
	Total	143	100.0	166	100.0	151	100.0
Educational Level	High Sch.	14	9.8	1	0.6	2	1.3
	Bachelor	42	29.6	67	40.4	48	31.8
	Master	61	43.0	97	58.4	77	51.0
	Doctorate	25	17.6	1	0.6	24	15.9
	Total	142	100.0	166	100.0	151	100.0
Age		n	M (SD)	n	M (SD)	n	M (SD)
		143	46.8 (12.17)	162	43.8 (10.48)	144	51.1 (9.21)

third section asked respondents to rate the extent that four personal characteristics (initiative, self-efficacy, love of learning, and interest in professional field/subject area) enhance their motivation to engage in the eight IWL activities. Likert scales, ranging from 1 to 5, were used for all closed-ended items in the first three sections. An open-ended item was provided at the end of each section for respondents to provide additional information concerning IWL activities, environmental inhibitors to IWL, and personal characteristics enhancing their motivation to engage in IWL. The fourth section of the survey contained demographic questions regarding the respondent's age, gender, educational level, total years of work experience, and years worked for their current employer.

The validity and reliability of the survey instrument have been established in a previous IWL study of two professional groups (Lohman, 2005). To ensure the instrument's suitability for information technologists, it was administered to 12 information technology professionals enrolled in a graduate information systems course at a mid-Atlantic university. Seven participants were male and five were female. Their mean age was 28.3 years ($\underline{SD}$ = 8.54). Participants provided written and oral feedback on the clarity and structure of survey items as well as the degree to which the items comprehensively reflected their IWL experiences. All participants indicated that the survey was comprehensive and they had no suggestions for improving the survey's clarity or structure.

Data Collection and Analysis

Mailing packets containing a cover letter, the questionnaire, and a postage-paid return envelope were prepared. Participant code numbers were assigned to the 600 information technologists selected to participate in the study and were placed on the lower right corner of the questionnaire's back page to maintain participant confidentiality and enable the researchers to track respondents and non-respondents. Two mailings were used to collect the data. The first mailing was distributed the third week of February 2005. Non-respondents were mailed a second packet six weeks later. The survey was administered to the teacher and HRD groups one year previously.

Descriptive statistics and ANCOVA were used to analyze the responses to the closed-ended items. The five demographic variables (gender, age, educational level, total work experience, and tenure with current employer) on which the three professional groups differed significantly were used as covariates.

Content analysis was used to analyze textual responses to the three open-end items (Miles & Huberman, 1994). This analysis process involved recording and coding the responses, categorizing the coded responses, and tabulating the number of responses in each category (Seidel & Kelle, 1995). Labels were generated to reflect the content of all responses in each category. Any category containing responses from more than 10 percent of the respondents in each group (information technologists, $\underline{n} \geq 15$; teachers, $\underline{n} \geq 16$; HRD professionals, $\underline{n} \geq 15$) was judged to reflect an important pattern among the responses and was reported as an additional finding.

Results

Three research questions concerning the IWL experiences of three professional groups were examined.

Q1: Do the IWL activities of information technologists differ from those used by teachers and HRD professionals?

As shown in Table 2, no significant difference was found among the three professional groups on the overall frequency with which they use all eight activities. The three IWL activities most frequently used by all groups were talking, collaborating, and sharing materials with others. Significant differences were found among the mean scores of the three groups on the frequency with which they engage in six of the eight IWL activities. Specifically, information technologists were found to collaborate with others significantly less than both teachers and HRD professionals. Teachers reflect on their actions significantly more than HRD professionals and information technologists, yet search the Internet and scan professional magazines and journals significantly less than the other two groups, as well as observe others significantly less than HRD professionals. Lastly, HRD professionals engage in trial and error significantly less than both information technologists and teachers.

One additional IWL activity was reported by more than 10 percent of information technologists. Twenty-three respondents indicated that they read books of various forms, including technical manuals, textbooks, e-books, white papers, and conference papers when they have a need to learn something new at work. No additional IWL activities beyond the eight identified in the closed-ended items of the survey were found for teachers or HRD professionals.

Q2: Do the environmental factors that inhibit information technologists from engaging in IWL differ from those that inhibit teachers and HRD professionals?

As shown in Table 3, the overall mean scores for the degree to which environmental factors inhibit IWL were above 2.0 for two of the five factors studied, time and proximity to colleagues' work areas. The overall mean scores of all groups for the other three environmental factors (access to computer technology, recognition, and monetary rewards) were below 2.0, indicating that respondents did not perceive them to be important inhibitors to IWL.

With regard to time, an analysis of the overall ratings for all IWL activities showed that teachers perceive that the lack of time inhibits them from engaging in IWL to a significantly greater degree than the other two professional groups. Moreover, significant differences were found among the three professional groups on the degree to which a lack of time inhibits engagement in five of the eight IWL activities studied. Specifically, a lack of time was found to inhibit teachers from talking, observing others, searching the Internet, and trial and error to a significantly greater degree than the two other groups. A lack of time also inhibits teachers from collaborating to a significantly greater degree than HRD professionals. While a significant difference was found among the groups on the degree to which proximity to colleagues' work areas inhibits searching the Internet, all the mean scores were below 2.0 indicating that respondents did not believe it to be an important inhibitor to IWL.

A comparison of additional environmental factors revealed that information technologists concur with HRD professionals in that an unsupportive organizational culture frequently inhibits them from engaging in IWL. While an unsupportive culture most frequently inhibits information technologists from talking and collaborating, it most frequently hinders HRD professionals from engaging in trial and error. Furthermore, all three groups indicated that the inaccessibility of others was an important additional environmental inhibitor. This inhibitor most frequently constrained information technologists from talking with others, teachers from observing and collaborating with others, and HRD professionals from collaborating with others. Teachers were the only group to report a lack of funds as an additional environmental inhibitor, with it most frequently hindering their observation of others. Moreover, information technologists were the only group to report that a lack of equipment and technology hinders their engagement in trial and error and a lack of meeting/work space inhibits their ability to talk with others.

Q3: Do the personal characteristics that motivate information technologists to engage in IWL differ from those that motivate teachers and HRD professionals?

As shown in Table 4, an analysis of overall mean scores found that initiative motivates teachers to engage in IWL activities to a significantly greater extent than the other two groups. Significant differences were also found among the three groups on the extent to which initiative influences engagement in six of the eight IWL activities studied. Specifically, HRD professionals indicated that initiative enhances their motivation to collaborate, observe, and share materials and resources with others to a significantly greater degree than teachers. Information technologists perceive that initiative enhances their engagement in trial and error to a significantly greater degree than teachers. In contrast, teachers' perception of the importance of initiative in motivating them to search the Internet and scan professional magazines and journals was significantly lower than both other groups.

Only one significant difference was found among the groups on self-efficacy, with it enhancing information technologists' motivation to share materials and resources to a significantly less extent than HRD professionals.

Table 2. *The Frequency with which Three Professional Groups use Eight IWL Activities.*

Informal Workplace Learning Activities	n	M	Std Error	F
Overall ratings for all IWL activities				
Information Techonogists	138	3.7	0.359	2.059
Teachers	159	3.8	0.331	
HRD Professionals	139	3.8	0.316	
Talk with others				
Information Techonogists	138	4.1	0.072	2.888
Teachers	159	4.3	0.066	
HRD Professionals	139	4.3	0.063	
Collaborate with others				
Information Techonogists	138	3.7 ^{ab}	0.075	4.960 *
Teachers	159	4.1 ^{a}	0.069	
HRD Professionals	139	4.0 ^{b}	0.066	
Observe others				
Information Techonogists	138	3.3	0.097	8.702 *
Teachers	159	3.0 ^{a}	0.090	
HRD Professionals	139	3.5 ^{a}	0.086	
Share materials and resources with others				
Information Techonogists	138	4.0	0.069	2.059
Teachers	159	4.1	0.064	
HRD Professionals	139	4.1	0.061	
Search the Internet				
Information Techonogists	138	4.3 ^{b}	0.091	30.408 *
Teachers	159	3.3 ^{ab}	0.084	
HRD Professionals	139	4.0 ^{a}	0.080	
Scan professional magazines and journals				
Information Techonogists	138	3.5 ^{b}	0.096	9.659 *
Teachers	159	3.1 ^{ab}	0.089	
HRD Professionals	139	3.6 ^{a}	0.085	
Trial and error				
Information Techonogists	138	3.6 ^{b}	0.098	9.057 *
Teachers	159	3.5 ^{a}	0.091	
HRD Professionals	139	3.1 ^{ab}	0.087	
Reflect on your actions				
Information Techonogists	138	3.7 ^{b}	0.084	10.228 *
Teachers	159	4.2 ^{ab}	0.077	
HRD Professionals	139	3.8 ^{a}	0.074	

Notes:.

1. Estimated marginal mean scores and standard errors, adjusted for 5 covariates (age, gender, educational level, years of work experience, and years worked for current employer), are reported.
2. Rating scale: 1 = Never use learning activity, 5 = Always use learning activity.
3. Means scores with the same superscript differ significantly.

* $p < .05$

Table 3. *The Frequency with which Two Environmental Factors Inhibit IWL Activities.*

	Environmental Factors							
	Time				Proximity to colleagues' work areas			
Informal Workplace Learning Activities	n	M	Std Error	F	n	M	Std Error	F
Overall ratings for all eight activities								
Information Technologists	121	2.9 ^{a}	0.549	8.229 *	121	2.1	0.649	0.369
Teachers	148	3.3 ^{ab}	0.494		148	2.2	0.584	
HRD Professionals	130	2.9 ^{b}	0.474		130	2.1	0.561	
Ratings for each activity								
Talk with others								
Information Technologists	135	2.8 ^{a}	0.094	13.700 *	135	2.5	0.122	0.412
Teachers	160	3.3 ^{ab}	0.086		159	2.5	0.112	
HRD Professionals	140	2.7 ^{b}	0.082		139	2.4	0.107	
Collaborate with others								
Information Technologists	135	3.2	0.176	4.335 *	135	2.6	0.121	0.007
Teachers	160	3.5 ^{a}	0.161		159	2.6	0.110	
HRD Professionals	140	2.9 ^{a}	0.153		139	2.6	0.105	
Observe others								
Information Technologists	135	3.1 ^{a}	0.100	29.446 *	135	2.9	0.133	0.641
Teachers	160	4.1 ^{ab}	0.092		159	2.9	0.121	
HRD Professionals	140	3.1 ^{b}	0.087		139	3.0	0.116	
Share materials and resources with others								
Information Technologists	135	2.7	0.097	3.172	135	2.5	0.113	0.592
Teachers	160	3.1	0.089		159	2.4	0.103	
HRD Professionals	140	2.8	0.084		139	2.5	0.099	
Search the Internet								
Information Technologists	135	2.3 ^{a}	0.103	16.848 *	135	1.3 ^{a}	0.086	6.391 *
Teachers	160	3.2 ^{a}	0.094		159	1.7 ^{ab}	0.079	
HRD Professionals	140	2.7 ^{a}	0.089		139	1.4 ^{b}	0.075	
Scan professional magazines and journals								
Information Technologists	135	3.3	0.101	1.093	135	1.6	0.092	1.508
Teachers	160	3.5	0.092		159	1.8	0.084	
HRD Professionals	140	3.3	0.088		139	1.6	0.080	
Trial and error								
Information Technologists	135	3.1 ^{a}	0.107	6.289 *	135	1.8	0.141	0.024
Teachers	160	2.6 ^{ab}	0.098		159	1.8	0.129	
HRD Professionals	140	2.9 ^{b}	0.093		139	1.8	0.123	
Reflect on your actions								
Information Technologists	135	2.9	0.112	2.468	135	1.5	0.086	0.510
Teachers	160	2.5	0.103		159	1.6	0.079	
HRD Professionals	140	2.6	0.098		139	1.6	0.075	

Notes.

1. Rating scale: 1 = Never inhibits engagement in learning activity, 5 = Always inhibits engagement in learning activity.
2. Estimated marginal mean scores and standard errors, adjusted for 5 covariates (age, gender, educational level, years of work experience, and years worked for current employer), are reported.
3. Means scores with the same superscript differ significantly.

* $p < .05$

Table 4. *The Extent to which Four Personal Characteristics Enhance Motivation to Engage in IWL Activities.*

	Personal Characteristics															
	Initiative				Self-efficacy				Love of Learning				Interest in Profession			
Informal Workplace Learning Activities	n	M	Std Error	F	n	M	Std Error	F	n	M	Std Error	F	n	M	Std Error	F
Overall ratings for all IWL activities																
Information Technologists	121	3.8 [a]	0.686	6.696 *	121	3.4	0.853	0.328	121	4.3	0.638	1.422	121	4.0	0.597	0.448
Teachers	148	3.5 [ab]	0.623		148	3.5	0.775		148	4.1	0.580		148	4.1	0.543	
HRD Professionals	130	3.9 [b]	0.599		130	3.5	0.745		130	4.1	0.557		130	4.1	0.522	
Ratings for each activity																
Talk with others																
Information Technologists	137	4.0	0.104	3.099	136	3.6	0.119	2.127	137	4.3	0.091	0.623	137	4.0 [ab]	0.086	7.918 *
Teachers	160	3.9	0.096		158	3.8	0.109		158	4.4	0.084		160	4.4 [a]	0.079	
HRD Professionals	138	4.2	0.092		140	3.9	0.104		141	4.4	0.080		140	4.5 [b]	0.076	
Collaborate with others																
Information Technologists	137	4.0	0.099	4.208 *	136	3.6	0.116	2.177	137	4.2	0.091	0.623	137	4.0 [ab]	0.088	6.579 *
Teachers	160	3.8 [a]	0.091		158	3.8	0.107		158	4.4	0.084		160	4.4 [a]	0.081	
HRD Professionals	138	4.2 [a]	0.087		140	3.9	0.101		141	4.3	0.080		140	4.4 [b]	0.077	
Observe others																
Information Technologists	137	3.5	0.113	8.379 *	136	3.2	0.127	1.213	137	4.0	0.108	0.930	137	3.7 [a]	0.106	5.337 *
Teachers	160	3.1 [a]	0.103		158	3.3	0.117		158	3.9	0.100		160	4.0	0.097	
HRD Professionals	138	3.7 [a]	0.099		140	3.4	0.111		141	4.1	0.094		140	4.1 [a]	0.093	
Share materials and resources with others																
Information Technologists	137	3.8	0.109	3.632 *	136	3.4 [a]	0.122	3.905 *	137	4.1	0.090	1.957	137	4.1 [a]	0.087	4.174 *
Teachers	160	3.7 [a]	0.100		158	3.8	0.112		158	4.3	0.083		160	4.4	0.080	
HRD Professionals	138	4.0 [a]	0.096		140	3.8 [a]	0.107		141	4.3	0.079		140	4.4 [a]	0.076	
Search the Internet																
Information Technologists	137	3.9 [a]	0.125	11.969 *	136	3.2	0.140	0.724	137	4.5 [a]	0.104	16.304 *	137	4.2	0.107	5.062 *
Teachers	160	3.2 [ab]	0.114		158	3.0	0.129		158	3.6 [ab]	0.097		160	3.7	0.099	
HRD Professionals	138	3.9 [b]	0.110		140	3.2	0.122		141	4.2 [b]	0.091		140	4.2	0.094	
Scan professional magazines and journals																
Information Technologists	137	3.7 [a]	0.119	10.035 *	136	3.3	0.133	0.615	137	4.5	0.260	1.430	137	4.2 [a]	0.107	5.326 *
Teachers	160	3.0 [ab]	0.109		158	3.1	0.122		158	3.8	0.240		160	3.7 [ab]	0.099	
HRD Professionals	138	3.7 [b]	0.105		140	3.2	0.116		141	4.1	0.227		140	4.1 [b]	0.094	
Trial and error																
Information Technologists	137	3.9 [a]	0.120	4.001 *	136	3.5	0.133	1.603	137	4.4 [ab]	0.108	11.593 *	137	4.0 [a]	0.118	5.320 *
Teachers	160	3.4 [a]	0.110		158	3.3	0.123		158	3.8 [a]	0.100		160	3.8	0.109	
HRD Professionals	138	3.6	0.106		140	3.2	0.117		141	3.7 [b]	0.095		140	3.5 [a]	0.104	
Reflect on your actions																
Information Technologists	137	3.7	0.119	0.028	136	3.3	0.135	2.003	137	4.0	0.111	1.408	137	3.8 [a]	0.111	5.710 *
Teachers	160	3.7	0.109		158	3.6	0.124		158	4.2	0.103		160	4.3 [ab]	0.102	
HRD Professionals	138	3.7	0.104		140	3.3	0.118		141	3.9	0.097		140	3.8 [b]	0.098	

1. Rating scale: 1 = Never inhibits engagement in learning activity, 5 = Always inhibits engagement in learning activity.
2. Estimated marginal mean scores and standard errors, adjusted for 5 covariates (age, gender, educational level, years of work experience, and years worked for current employer), are reported.
3. Means scores with the same superscript differ significantly.

* $p < .05$

Two significant differences were found among the groups on love of learning. It was found to enhance teachers' motivation to search the Internet to a significantly less extent, as well as enhance information technologists' motivation to engage in trial and error to a significantly greater extent, than the two other professional groups.

Interest in one's profession was found to enhance information technologists' motivation to talk and collaborate to a significantly less degree than both other groups as well as to observe and share materials and resources to a significantly less degree than HRD professionals. In contrast, information technologists reported that this same personal characteristic enhances their motivation to engage in trial and error to a significantly greater degree than HRD professionals. Meanwhile, teachers indicated that interest in their profession motivates them to scan professional magazines and journals to a significant less degree and to reflect on their actions to a significantly greater degree than the two other professional groups.

Additional personal characteristics reported by all respondent groups were also compared. The comparison found that integrity, an outgoing personality, and a teamwork ethic are attributes that all three professional groups perceive to be enhancers to IWL. While integrity—expressed as taking pride in one's work, the desire to do one's work well, and continually improving one's skills/performance—most frequently motivates information technologists to talk with others, it most frequently motivates the other two professional groups to scan magazines and journals and, for teachers, to reflect on their actions. There was consensus among the three groups that an outgoing personality—described as enjoying social situations and a friendly disposition—most frequently promotes talking with others. In addition, while a teamwork ethic—expressed as respecting and empathizing with others, mentoring others, and being a team player—was cited by information technologists as enhancing their motivation to collaborate with others, both teachers and HRD professionals reported that it most frequently promotes sharing materials and resources with others. Interestingly, curiosity (expressed as being intrigued by technical and professional challenges and questions) and open-mindedness (described as the ability to seek out, listen to, and value other's input) were found to be important additional personal characteristics for only information technologists.

Discussion

A survey was conducted to analyze the IWL experiences of three professional groups. Data analysis found that the three groups generally use interactive more than independent IWL activities. Five environmental factors (insufficient time, lack of proximity to colleagues' work areas, inaccessibility of others, unsupportive culture, and insufficient funds) inhibited engagement in IWL activities. Nine personal characteristics were found to counteract these inhibitors by enhancing respondents' motivation to engage in IWL: initiative, self-efficacy, love of learning, interest in the profession, integrity, open-mindedness, teamwork ethic, outgoing personality, and curiosity.

This study had two limitations. First, information technologists and HRD professionals were selected from membership lists of professional associations in their respective fields. It is possible that individuals with such memberships may have a greater commitment to their professional development than the general professional population. As such, the findings of this study seem most appropriate for those professionals committed to improving their professional practice. This was not a concern with the teacher participants because the database from which they were selected contained a comprehensive list of public school teachers employed by school districts throughout the United States. A second limitation was the survey response rates (27.7 for teachers, 25.3 for HRD and 24.1 for information technologists). A concern that the response rates may have limited the generalizability of the study was investigated by comparing the demographic characteristics of respondents in each group to the demographic profile of their respective population. The comparison found that the three respondent groups were highly similar to their respective populations and, therefore, increases the confidence that the study's findings may be generalized to the populations of interest (Dooley & Lindner, 2003).

Implications for HRD Theory of IWL

The current study's findings corroborate earlier studies regarding the reliance of professionals on the eight IWL activities studied (Lohman, 2005). The present study extends understandings of this topic by revealing that all three professional groups tend to prefer interactive IWL activities, although preferences for specific learning activities vary somewhat among the three groups. A noteworthy example of this was that information technologists and HRD professionals search the Internet to a significantly greater degree than teachers, while teachers reflect on actions to a significantly greater degree than the other two professional groups.

The study's findings concerning environmental inhibitors may help to explain these learning preferences. A lack of time was found to inhibit all three groups from engaging in all IWL activities studied. However, insufficient time was a particularly strong inhibitor for teachers. Because a lack of time did not inhibit information technologists and HRD professionals to as great an extent as teachers and because these two professional groups possibly have greater access to computers and other information sources than teachers, they appear more likely than teachers to search the Internet when they have a need to learn at work.

The degree to which they do so, however, was found to vary based on the accessibility and support of colleagues in the work environment. This finding is consistent with the workplace learning models of Doornbos et al (2004) and van Woerkom et al. (2002) and the findings from Kwakman's (2003) empirical study in which collegial availability and support as well as organizational climate for learning are identified as factors influencing participation in IWL activities. In the current study, a lack of time was cited by respondents in all professional groups as a key reason for relying heavily on interactive IWL activities. However, many information technologists and HRD professionals reported that they turn to independent IWL activities because their organizational cultures and colleagues were not supportive of collegial interaction and sharing.

The current study corroborates aspects of the workplace learning models of Doornbos et al. (2004) and van Woerkom et al. (2002) in identifying four personal characteristics—initiative, self-efficacy, love of learning, and interest in one's profession—that enhance motivation to engage in all eight IWL activities studied. The present study also revealed five additional personal characteristics that enhance such motivation—integrity, outgoing personality, open-mindedness, a teamwork ethic, and curiosity.

Implications for HRD Practice in Promoting IWL

This study's findings give rise to three important implications for HRD's role in enhancing IWL. First, human resource developers should advocate for a greater amount of unencumbered time in a professional's work day. However, simply increasing unencumbered time may not be sufficient to foster IWL. Control over free time is also a critical element in informal learning (Hargreaves, 1992). As a consequence, increased amounts of unencumbered time with discretion over how that time is used would provide greater opportunities for engagement in IWL.

Second, human resource developers should strategically design work areas so that employees are located near colleagues in the same technical or professional areas. Strategically assigning work areas in this way should decrease the strength of two environmental inhibitors to IWL (lack of time and lack of proximity to others' work areas) and thereby promote collegial interaction and sharing (Dobbs, 2000).

A third recommendation for promoting IWL is to create virtual communities of professionals via organizational Intranets. In the current study, all three groups reported that the inaccessibility of others was an environmental inhibitor to IWL. Because this inhibitor includes both the absence of others who possess necessary expertise as well as the unwillingness of others to help, participation in virtual communities should be voluntary and meaningful incentives for participation should be provided. Virtual communities would improve access to learning resources and enhance the perceived support of the organizational culture for IWL, thereby helping professionals communicate with others and gather information when the need to do so arises (Tobin, 1998).

Implications for HRD Research of IWL

One area for future research is the design of an instrument to assess an employee's inclination to engage in IWL, as measured by the nine personal characteristics that were found to enhance motivation to engage in IWL. This assessment could be used for performance coaching purposes to cultivate workers who are able to continuously learn and grow, even when adequate environmental resources are constrained. A second area for future research is the creation of a diagnostic instrument for auditing an organization's work environment to determine the degree to which it supports IWL. Based on this study's findings, the diagnosis should assess the degree to which an organization's culture, design, policies and procedures, and people support engagement in IWL.

Contributions to New Knowledge In HRD

This study makes two important contributions to new knowledge in HRD. One contribution is the refinement of a survey instrument for measuring IWL. A second contribution is greater understanding of the personal and environmental factors that influence IWL. These two contributions are important to HRD because they provide a valid and reliable means of assessing factors that influence IWL as well as provide information about the characteristics of workers and work environments that typically promote or inhibit IWL.

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