

## Workers' Power and Intentional Learning among Non-managerial Workers A 2004 Benchmark Survey

### Le pouvoir des travailleurs et l'apprentissage volontaire chez le personnel d'exécution L'enquête repère de 2004

### Poder de los trabajadores y aprendizaje voluntario de los trabajadores no cuadros Una encuesta de referencia efectuada en 2004

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Résumé de l'article

Cet essai examine les relations entre le pouvoir des travailleurs et leurs activités d'apprentissage volontaires. Le pouvoir des travailleurs se définit ici en termes d'autorité négociée acquise par la syndicalisation et d'autorité déléguée par les employeurs pour participer à la prise de décision organisationnelle. L'apprentissage volontaire est perçu en termes de participation à des cours formels d'éducation aux adultes aussi bien qu'en termes d'apprentissage informel lié à l'emploi. Il n'y a eu que très peu d'études théoriques ou empiriques sur la relation entre le pouvoir des travailleurs et l'acquisition de connaissances. Mais ce sujet devient hautement important quand on pense à l'émergence publicisée de l'économie du savoir et au besoin supposé d'une main-d'œuvre plus instruite. L'hypothèse principale est à l'effet que les travailleurs qui ont le plus de pouvoir dans les établissements sont les plus en mesure de saisir les occasions de s'impliquer dans plusieurs aspects de l'apprentissage en milieu de travail.

L'étude antérieure la plus pertinente à notre sujet s'est intéressée aux relations entre la syndicalisation et la participation à diverses activités d'éducation aux adultes. Les conclusions des études antérieures sont réévaluées et leur absence de cohérence est attribuable avant tout à l'échantillonnage et aux différences au plan de la définition des concepts. En réalité, il n'y a pas eu de recherche empirique antérieure sur l'autorité déléguée aux travailleurs sur les lieux de travail et sur l'apprentissage lié à l'activité de travail.

L'analyse empirique effectuée ici est principalement basée sur une enquête canadienne sur l'activité de travail et la formation continue (voir <[www.wallnetwork.ca](http://www.wallnetwork.ca)>), la seule enquête à ce jour à se centrer sur l'éducation formelle et informelle des adultes. C'est une étude détaillée qui s'intéresse également au statut syndical et au rôle de décideur organisationnel. Les résultats sont analysés en regard de ceux d'une enquête de l'année 1998 portant sur l'éducation des adultes et l'apprentissage informel qui retenait aussi le statut syndical. L'analyse concerne des employés d'exécution dont l'âge varie entre 25 et 64 ans. En plus de l'analyse de l'enquête canadienne sur l'activité de travail et la formation continue, nous avons aussi pris en compte des données provenant de l'Enquête sur l'éducation et la formation des adultes de Statistique Canada de 2003 ainsi que des enquêtes pertinentes du Royaume-Uni et de la Californie.

Ces analyses démontrent l'effet positif et récurrent de l'appartenance syndicale sur la participation à l'éducation des adultes. La participation à la prise de décision organisationnelle exerce également un effet positif et important sur la participation à l'éducation des adultes. Peut-être, et c'est ce qui apparaît le plus significatif, ces effets sont-ils cumulatifs : les membres des syndicats qui ont une délégation d'autorité sur le lieu de travail présentent les taux de participation les plus élevés, alors que les membres non syndiqués sans autorité déléguée ont les taux les plus bas. Ces observations demeurent significatives lorsqu'on tient compte des variables telles que le degré atteint en éducation des adultes, l'âge et d'autres variables de contrôle.

L'apprentissage spontané et volontaire est beaucoup plus répandu que l'éducation formelle des adultes et échappe aux contraintes des relations de pouvoir institutionnel. Cependant, quelques aspects de l'apprentissage spontané sur le tas semblent entretenir une relation significative avec le pouvoir des travailleurs. Les membres d'un syndicat sont plus susceptibles de s'impliquer dans une activité d'apprentissage dont les enjeux sont la santé et la sécurité aussi bien que la politique interne, alors que ceux qui ont une fonction d'autorité déléguée sont plus susceptibles de s'adonner à des activités d'apprentissage liées à l'acquisition d'habiletés managériales et organisationnelles; deux modèles qui sont tout à fait prévisibles en termes de dispositions faisant l'objet d'une négociation avec le syndicat et en termes d'une prise de décision de caractère organisationnel. Mais l'appartenance syndicale et également les fonctions liées à une délégation d'autorité sur les lieux de travail ont des effets positifs sur l'apprentissage informel qui consiste à se tenir à jour dans son domaine occupationnel, et ces effets sont cumulatifs. Les membres d'un syndicat qui exercent des fonctions d'autorité déléguée présentent le taux de participation le plus élevé dans un effort de maintenir à jour leurs connaissances en lien avec leur occupation.

L'hypothèse de base d'une association positive entre le pouvoir des travailleurs et une plus grande propension à l'apprentissage volontaire est en règle générale confirmée. Les implications de ces observations doivent être envisagées dans le contexte général canadien d'un déclin de la densité syndicale et de l'augmentation de l'implication des travailleurs dans des formes limitées de prise de décision organisationnelle, de même qu'en tenant compte de l'insuffisance de données sur les changements récents dans les taux de participation à l'éducation des adultes chez les travailleurs non cadres. Les conclusions fondamentales de cette étude, tout comme les comparaisons internationales, laissent croire que dans les établissements où les syndicats sont bien accueillis et où l'implication des travailleurs dans la prise de décision organisationnelle est encouragée, l'apprentissage volontaire chez les travailleurs est susceptible d'atteindre un sommet. Ces conclusions fournissent des points de repère pour l'éclosion d'études sur l'apprentissage sur le tas au moment où le travail de traitement de l'information et la formation continue deviennent le noyau de la vie économique.

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# ***Workers' Power and Intentional Learning among Non-managerial Workers***

## ***A 2004 Benchmark Survey***

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*This paper explores relations of workers' power, in terms of unionization and delegated workplace authority, with incidence of participation in adult education and job-related informal learning activities. Empirical analysis is based primarily on the first Canadian survey to document both aspects of workers' power and both formal and informal learning. Prior inconsistent research on unionization and adult education is critically reviewed. The current study focuses on non-managerial employees between 25 and 64. The findings of this 2004 survey, as well as secondary analysis of other relevant surveys, confirm that union membership is consistently positively related to both participation in adult education and some informal learning topics. Delegated workplace*

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  - The primary data analyzed in this paper are drawn from a survey by the research network on the Changing Nature of Work and Lifelong Learning (WALL) funded by the Social Sciences and Humanities Research Council (SSHRC) from 2002 through 2006 as a Collaborative Research Initiative on the New Economy (Project No. 512-2002-1011). A prior version of this paper was presented at the “Restructuring Work and Labour in the New Economy: Exploring Resistance and Alternatives” Conference, York University, Toronto, March 2-4, 2006. The research in this paper was funded by the Research Alliance on “Restructuring Work and Labour in the New Economy” at York University.

*authority also has positive effects on both adult education and some informal learning topics. While delegated workplace authority is not related to unionization, their positive effects on workers' intentional learning are additive. Implications of these findings for further research and optimizing workplace learning are discussed.*

Research interest in workplace learning has burgeoned over the past decade, in large part because rapidly increasing use of information technologies is presumed to require continual upgrading of workers' skills and knowledge to ensure their productive use (see Boud and Garrick, 1999). The much heralded "knowledge-based economy" is seen to require growing numbers of workers exercising increasing discretion in mediating the information processing that is at the core of this economy (Cortada, 1998). More generally, discretionary power and relevant knowledge are widely assumed to be intimately related, with the most powerful having greatest access to relevant knowledge and the most knowledgeable thereby gaining influence over the less knowledgeable. Empirical studies of learning and work have found that the general relationship between voluntary work and informal learning is much stronger than that between paid work and informal learning, suggesting a very positive association between discretionary power and learning activities (Livingstone, 2001). However, scant prior attention has been given to assessing actual relations between hired workers' workplace power and their participation in learning activities. Determining whether and to what extent workers' capacities to exercise power in their workplaces is associated with continuing learning activities should be of strategic interest in terms of organizing knowledge-based workplaces.

Our focus in this paper will be on non-managerial hired workers, as distinct from enterprise owners who exercise proprietorial power over the workplace and hired managers who exercise managerial prerogative as their primary responsibility. We will consider two dimensions of workers' power: the *negotiated authority* they derive from the strength of unions and other collective bargaining associations, and the *delegated authority* in the workplace they are assigned by their employers to participate in organizational decision-making about significant issues beyond their own assigned technical tasks. These dimensions are estimated by trade union membership and reported organizational decision-making roles.

Learning involves the gaining of knowledge and skill or achieving understanding anytime and anywhere through individual and group processes. The primary focus of the current analysis will be on intentional learning activities. Such intentional learning occurs in sites of widely varied formality. Basic types of intentional learning include: *formal schooling*;

*formal adult education; informal education or training; and non-taught individual or collective informal learning* (see Livingstone, 2006a, as well as Colley, Hodkinson and Malcom, 2003 for further definition and critical discussion of these distinctions). Few empirical studies to date have paid comparable attention to both formal and informal learning activities, most often concentrating on more easily recorded formal education. We will limit attention to adults over 25 years of age who have generally completed their initial period as full-time students in formal schooling programs. Our focus will be on formal adult education courses/workshops and on *job-related* informal learning.

The main hypothesis of this paper is that workers who have more power in the workplace are more likely to engage in most aspects of workplace-related learning, including adult education courses as well as informal learning activities. More specifically, we posit that workers who are union members, as well as non-union members in workplaces that recognize unions, will generally be enabled to engage more fully in learning activities than non-union members in workplaces that do not recognize unions. Secondly, we posit that workers who are able to exercise greater authority in terms of involvement in organizational decision-making are more able to participate in job-related learning activities. The premise in both respects is that, since the potential for continual endogenous learning is pervasive in the labour process (Pankhurst and Livingstone, 2006), those workers who have greater discretionary control over their working conditions are empowered to take more of these opportunities to engage in related learning activities. If this hypothesis is confirmed, it would suggest that giving increasing discretionary power to non-managerial workers is an optimal strategy for organizing knowledge-based workplaces.

### **PRIOR RESEARCH**

Working people have become much more highly educated in terms of formal schooling in recent generations, particularly in Canada where over half of the 25 to 64 population now has some form of post-secondary education completion, the highest rate in the world (CMEC and Statistics Canada, 2006). But research on workers' continuing learning beyond initial formal schooling and on the association of such learning with workers' power has been very limited and inconsistent.

Most of the prior empirical studies have focused on the relationship between individuals' union membership status and participation in adult education courses. We will first review this literature and then the smaller array of studies dealing with organizational authority and adult education.

There are inconsistent findings among the existing studies on union membership and adult education. A number of Canadian and international studies have found *lower* levels of participation in adult education amongst unionized employees (e.g., Green and Lemieux, 2001). Others have found mixed, small or inconsistent, union effects for different types of workers (e.g., Boheim and Booth, 2004). A number of international studies (e.g., Green, Machin, and Wilkinson, 1999) as well as some Canadian studies (e.g., Betcherman, Leckie and McMullen, 1997) have found significant positive effects of union membership on participation in adult education. In addition, some recent studies which review the economic effects of workplace unionization (Aidt and Tzannatos, 2002), personnel training (Ericson, 2005) and union impact on management (Verma, 2005), suggest similarly positive union influences on some aspects of adult education. A more complete review of research on union impact on education is available in Livingstone and Raykov (2005).

A recent review by the Trades Union Congress (2005) finds that union members generally participate more in training than non-union members, that the union effect is increasing over time and that this effect is significantly greater in the public sector than in the private sector. Our own prior Canadian study (Livingstone and Raykov, 2005) found that union membership had a significant positive influence on employees' participation in adult education.

While the available evidence is increasingly in favour of a positive union effect, it is likely that some of the previous negative or mixed results are caused mainly by sampling and definitional differences. Some studies have included many young people under 25 who are increasingly oriented to completing schooling and have had little chance to have become union members. Some studies have included managerial personnel who may be proscribed from union membership, be designated by employers to negotiate with other unionized workers, and are also among the most favoured participants in adult education. In terms of participation in adult learning *per se*, diverse indicators have been relied on, including participation rates in various types of adult education courses or in job-related training programs, sources of funding support, and the amount of time devoted to participation in job-related education and/or training.

Empirical studies directly addressing relations between organizational authority and learning are rare. Kohn and Schooler's (1973) research which discovered reciprocal effects between holding less supervised jobs with greater discretionary control and engaging in more intellectually demanding leisure-time activities such as hobbies and general interest reading is suggestive but focuses on personal task discretion rather than power relations and has had little follow up. Karasek (1979) developed a more complex model relating

personal job control and job demands to mental strain. Karasek and Theorell (1990) expanded this model in relation to a wide variety of behavioural outcomes including active learning. But the active learning component of the model remains under-examined in this “job socialization” approach, perhaps because learning was not a central concern in its epidemiological origins, diverse notions of learning have been used and the few studies to date have found inconsistent effects of control and demand on learning measures (Karasek, 2004; Kwakman, 2003; Taris and Kompier, 2005). As previously noted, time spent in volunteer work, with more discretionary control, has been found to have a much stronger association with related informal learning than more constrained paid job time had with job-related *informal* learning (Livingstone, 2001). Canadian teachers, who are highly unionized and report greater discretionary control over work tasks than most other occupational groups, also have among the highest rates of participation in adult education (Livingstone and Antonelli, 2007).

In sum, most prior studies of relations between workers’ power and learning activities suffer from three limitations:

- diverse measures of unionization or workplace authority, rarely if ever both;
- diverse measures of workers’ adult education, more rarely of informal learning, rarely if ever both;
- diverse sample selections, with possible union effects often confounded by including managerial personnel ineligible for unions and young people with continuing student status.

The current study attempts to address these limitations by analyzing evidence from a recent country-wide survey that includes both measures of union membership status and organizational decision-making participation, as well as measures of both adult education and job-related informal learning, and focuses on the 25 to 64 aged non-managerial employed labour force.

### ***Current Study***

The Changing Nature of Work and Lifelong Learning (WALL) Survey was conducted in 2004. (For further information on sample selection, composition and the detailed interview schedule, see the network website: <[www.wallnetwork.ca](http://www.wallnetwork.ca)>). The present WALL survey analysis includes a sub-sample of 2,895 non-managerial employees aged 25 to 64 and examines data about general demographic features (age, sex, educational attainment), organizational features (organizational decision-making participation, organizational sector, organization size), union and other collective bargaining association membership status, and participation in adult education courses and in informal learning activities. The main questions on workers’ power

and learning activities are available as an appendix from the authors and may be found in the WALL Codebook (Livingstone, 2006b).

The WALL questions replicated wherever possible the wording of prior surveys' relevant questions on these matters, most notable Statistics Canada's Adult Education and Training Survey (AETS) series' basic question on adult education participation as well as the items on job-related informal learning in the New Approaches to Lifelong Learning (NALL) survey, the first Canadian survey of formal and informal learning practices conducted in 1998 (see Livingstone, 1999). To our knowledge, virtually no other prior country-level surveys have attempted to document informal learning activities in relation to unionization or other aspects of workers' power (see Livingstone and Raykov, 2005).

In addition to analysis of the WALL survey, we present secondary analysis of union status and adult education participation using several other relevant surveys including also subsamples of respondents 25 to 64 years old. These include Statistics Canada's 2003 AETS survey. The most recent British Workplace Employees Relation Survey (WERS) of 2004 is used to assess the effect of union recognition on non-unionized workers' adult education (Kersley et al., 2005). The California Workplace Survey (CWS) of 2001-2002 is used to assess union membership status and participation in employer-supported versus personally-financed, job-related adult education (Piazza, Fligstein and Weir, 2002).

### STATISTICAL ANALYSIS

The primary findings are presented in terms of percentages of participants in adult education courses and job-related informal learning by different categories of union and professional association membership status and organizational decision-making role. Since our study includes mainly nominal dichotomous variables, in addition to standard inference statistics (chi-square and percentage differences), most results on likelihood of participation in intentional learning are expressed in terms of raw odds ratios in logistic regressions for unionized versus non-unionized workers and/or those with and without organizational authority roles. One advantage of logistic regression is the possibility of multivariate analysis including nominal level variables and assessing the effects of other potential influences on workers' learning. The possible effects of age, sex and educational attainment as well as organizational size and public versus private sector are also taken into account in adjusted odds ratios (see Hosmer and Lemeshow, 2000). Level of statistical significance in the following tables is indicated as follows:  $p < 0.001$ ,  $p < 0.01$ ,  $p < 0.05$ , NS = not significant. *It should also be underlined that the cross-sectional survey data analyzed here do no permit inferences of causality but merely association.*

### ***UNION MEMBERSHIP AND ORGANIZATIONAL AUTHORITY***

The first question to address is what relationship, if any, there is between negotiated and delegated aspects of workers' power in the workplace. The basic interests of owners and top managers and those of non-managerial employees are both shared and oppositional. Both have an interest in ensuring the survival of the organization. But owners are primarily interested in obtaining more efficient production from workers to ensure profitability and cost reduction, whereas non-managerial workers are primarily interested in ensuring decent working conditions and sustainable benefits. There is no inherent logic in capitalist production systems compelling owners to delegate decision-making authority to workers; various circumstances may encourage either more participatory or more coercive management styles. Conversely, it may be in the interest of workers to organize collectively to negotiate better general working conditions, but a strong union can dissuade owners from delegating more organizational authority to its members.

There is survey evidence that delegated authority has been increasing in Canadian paid workplaces over the past generation. In 1983, only about 20 percent of non-managerial employees participated in organizational decision-making; by 2004, the proportion had increased to 45 percent (Livingstone and Scholtz, 2006). The increases have been among industrial workers and service workers rather than managers and professional employees, a pattern that may be consistent with the presumed need for lower level workers to exercise greater discretion in information processing work. In any case, as we will discuss later, unionization rates have been slower growing or declining in comparison. At this point, as Table 1 shows, there does not appear to be any significant association between unionization and delegated organizational authority in Canada. Therefore our further analyses here will assess the individual effects of these two factors on workers' intentional learning.

TABLE 1

**Union Membership Status and Participation in  
Organizational Decision-making, Canada, 2004**

	<i>Decision-maker (%)</i>	<i>Non-Dec.-maker (%)</i>	<i>Total (%)</i>
Non-member	45.0	55.0	54.3
Member	45.6	54.4	45.7
Total	45.2	54.8	100

Source: WALL, 2004; N = 2,895. Chi-square = 0.107<sup>ns</sup>.



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## ***WORKERS' POWER AND ADULT EDUCATION***

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We first present empirical findings related to workers' power and adult education, followed by analysis of relations between workers' power and informal learning. The effects of unionization and organizational authority as well as their combined effects on learning activities will be considered.

It should be stressed here that those with higher formal educational attainment and younger age groups have always been found to have greater participation in adult education. The rapid increase in post-secondary completion rates since the early 1960s in Canada was associated with similarly rapid increases in participation in adult education (Livingstone, 2002). While declining participation in adult education remains strongly associated with aging, the decline is becoming more gradual with a more highly educated population (Livingstone, 2007). Some prior research has also found differential educational participation rates by sex, with women increasingly having higher rates than men (Statistics Canada, 2001). Larger organizations are generally able to offer greater formal training provisions (Betcherman, Leckie and McMullen, 1997). Therefore, all basic findings on workers' power and learning in this paper will be assessed for independent effects controlling for levels of educational attainment and age, as well as for possible sex differences and organizational size.

### ***Unionization and Adult Education***

Research on the impact of unions on participation in adult education suffers from a lack of data on *organizational* effects. There are probably sector-level contextual effects of union density. For example, about three-quarters of public sector workers are unionized in Canada while less than one quarter of private sector workers are (Statistics Canada, 2005). Correspondingly, according to the WALL survey, the majority of public sector workers (63 percent) participated in adult education courses throughout 2004 compared to only a plurality (44 percent) of private sector workers. While non-union members within both sectors have lower participation rates than union members, non-unionized public sector workers have somewhat higher participation rates than unionized private sector workers—at least partly through the contextual effect of higher public sector union density. This effect will be controlled for in the following statistical analyses.

At the organizational level, the presence of unions provides general wage and benefits premiums for all workers (e.g., Fang and Verma, 2002). Few surveys have been able to assess the training effects of the presence of unions on *non-union* workers. The UK WERS Survey data provide a

rare opportunity for a closer exploration of both organizational-level and individual union status effects on adult education.

As Table 2 shows, about half of non-union members in UK workplaces without union recognition participated in *employer-sponsored* training in 2004. All unionized employees as well as non-unionized employees in workplaces with union recognition had higher participation rates by about two-thirds. Unions within workplaces were found to provide a significant training premium for all employees.

TABLE 2  
**Incidence and Likelihood of Employer-sponsored Training by  
Union Membership Status and Union Recognition at Workplace,  
United Kingdom, 2004**

	<i>Participation (%)</i>	<i>Raw Odds</i>	<i>Odds*</i>
Non-Member			
No Union	51.9	1	1
Union Exists	66.0	1.80 <sup>a</sup>	1.57 <sup>a</sup>
Union Member			
No Union	64.3	1.67 <sup>a</sup>	1.69 <sup>a</sup>
Union Exists	66.1	1.81 <sup>a</sup>	1.78 <sup>a</sup>
Total non-managerial labour force	62.1		

Source: WERS, 2004; N = 13,091. Respondents 22-64 years old, non-managers or supervisors.

\* Odds ratios adjusted for age, sex and educational attainment.

A related 2004 WERS survey of managers (Kersley et al., 2005) found that in companies without union recognition, only a quarter of managers inform, consult or negotiate training with employees. In contrast, in workplaces where unions are recognized, two-thirds of managers inform, consult or negotiate training with employees. The results from these UK studies suggest that, in addition to individual union membership, future research should generally include indicators of union recognition at workplaces.

While the provision of employer-sponsored further adult education and training may be significantly enhanced by the presence of unions, workers can, of course, pursue adult education on their own. The 2001-2002 California Workforce Survey (CWS) has specific data on participation in training paid for by an employer and from the resources of workers (Piazza, Fligstein and Weir, 2002). Our secondary analyses of these data show that union members were much more likely to get employer-sponsored training

than non-union members (71 percent versus 48 percent) but only marginally more likely to pay personally for their adult education (24 percent versus 19 percent). The following analysis of Canadian workers' adult education deals with general participation rates rather than specific employer sponsorship, but it should be noted that significant differences are likely related to the extent of employer sponsorship.

The primary data source on adult education participation in Canada has been the Adult Education and Training Survey by Statistics Canada which provided national-level estimates during the 1990s (Statistics Canada, 2001). The only AETS survey since then, in 2003, restricted itself to job-related training only (see Peters, 2004). Our secondary analysis of the data in this survey on job-related adult education and union status is summarized in Table 3. The results show that union members were significantly more likely to participate in adult education, by at least a third. When adjusted for possible effects of age, sex and educational attainment, the difference in favour of union members remains about the same.

TABLE 3  
**Union Membership Status and Participation in Job-related Training,  
Canada, 2003**

	<i>Participation (%)</i>	<i>Raw Odds</i>	<i>Odds*</i>
Non-member	35.5	1	1
Member	43.0	1.37 <sup>a</sup>	1.36 <sup>a</sup>
Total	38.2		

Source: AETS, 2003; N = 12,942.

\* Odds ratios adjusted for age, sex, and educational attainment.

It should be noted here that, according to AETS, the rate of participation of Canadian workers in formal, job-related training increased from 29% in 1997 to 35% in 2002 (CMEC and Statistics Canada, 2006: 63-65). The Statistics Canada Adult Literacy and Life Skills Survey of 2003 (Statistics Canada and OECD, 2005) and the WALL survey provide the only inclusive recent country-level estimates of general participation in adult education in Canada since 1997. Both the ALL and WALL surveys found general participation rates of around 50 percent in the 2003-4 period. The prior AETS studies had found a slight *decline* in general participation between 1993 and 1997 (Statistics Canada, 2001: 34). Comparison of the ALL 2003 results with a 1994 International Adult Literacy Survey indicated a significant general increase over this period (Statistics Canada and OECD, 2005: 83). Comparison of the 2004 WALL survey with the 1998 NALL survey found virtually the same levels of general participation in both years.

The general adult education question used in all of these surveys is available in the WALL Codebook (Livingstone, 2006b). While Statistics Canada samples are larger and therefore more reliable, there is insufficient consistent information at this point to infer country-level trends in the general adult education participation rates of *non-managerial* employees.

The basic WALL findings on union status and adult education in 2004 are summarized in Table 4 and compared with the results of the 1998 NALL survey. About half of all non-managerial employees participated in some form of adult education in both years. The general adult education participation rates and union/non-union differences in the 1998 and 2004 Canadian surveys are very similar to those in the 2004 UK study for employer-sponsored adult education, with majorities (about 58 percent) of all union members participating compared to minorities (42 to 45 percent) of non-members in both years. When the odds of participation are adjusted for age, sex and educational attainment, there is an 80 percent premium for union membership in 2004, and over a 50 percent premium when either public/private sector or organizational size factors are added. Additional analyses of specific occupational classes of non-managerial employees in 2004 show a significant union impact on levels of participation in adult education among professional employees, service workers and industrial workers, respectively.<sup>1</sup>

TABLE 4

**Union Membership Status and Participation in Adult Education, Canada, 1998-2004**

	1998 Participation (%)	2004 Participation (%)	2004 Raw Odds	2004 Odds*	2004 Odds**	2004 Odds***
Non-member	45.7	42.4	1	1	1	1
Member	58.2	57.9	1.87 <sup>a</sup>	1.81 <sup>a</sup>	1.64 <sup>a</sup>	1.58 <sup>a</sup>
Total	50.8	50.8				

Sources: NALL, 1998; N = 431. WALL, 2004; N = 2,895.

\* Odds ratios adjusted for age, sex, and educational attainment.

\*\* Odds ratios adjusted for age, sex, educational attainment and sector.

\*\*\* Odds ratios adjusted for age, sex, educational attainment and organization size.

1. While Canadian surveys have consistently found greater employer support for training of professional employees than industrial and service workers, our analyses have found consistent effects of unionization (including collective bargaining associations) on adult education rates among all three occupational classes.

The WALL survey, as most prior surveys that have tried to distinguish job-related and general interest courses, found that over 80 percent of workers' adult education was identified as job-related. Much of this adult education is designated on-the-job training. But "job-related" is a vague distinction. In workplaces with strong unions, a wide array of general interest courses may be jointly recognized in collective bargaining (Livingstone and Sawchuk, 2004). In any case, the 2003 AETS findings on union status and job-related adult education and the 2004 WALL findings on union status and both job-related and general adult education are quite similar.

### *Workplace Authority and Adult Education*

The WALL survey asked non-managerial respondents whether or not they participated in making decisions about such things as the products or services delivered, the total number of people employed, budgets. As Table 5 summarizes, non-managerial workers with some delegated authority for workplace decision-making are significantly more likely to participate in adult education than those workers who are excluded from such roles (about 58 percent versus 46 percent). The adjusted odds show more than a fifty percent greater likelihood for those with greater job control in these terms to take adult education.

TABLE 5  
**Participation in Organizational Decision-making and Adult Education,  
Canada, 2004**

	<i>Adult Education (%)</i>	<i>Raw Odds</i>	<i>Odds*</i>	<i>Odds**</i>	<i>Odds***</i>
Non-decision-maker	45.5	1	1	1	1
Decision-maker	57.8	1.64 <sup>a</sup>	1.56 <sup>a</sup>	1.65 <sup>a</sup>	1.53 <sup>a</sup>
Total	50.8				

Source: WALL, 2004; N = 2,895.

\* Odds ratios adjusted for age, sex, and educational attainment

\*\* Odds ratios adjusted for age, sex, educational attainment and sector

\*\*\* Odds ratios adjusted for age, sex, educational attainment and organization size.

Further analysis of the WALL survey considering workers' technical control, in terms of their opportunities to plan or design their own work, finds similar differences in adult education participation rates. While technical task discretion is presumably intimately related to continuing education needs, the significant relation with organizational decision-making role underlines the mediational effect of workers' social power in determining access to adult education provisions. The social division of labour in terms of delegated authority and the technical division of labour in terms of task

discretion have been conflated in much prior research on the labour process (see Livingstone, 1998) and both aspects of workers' discretion warrant much more research in relation to workers' learning activities. In any case, given the lack of prior research on workplace authority and adult education, the present results provide a reference point for continuing studies.

### *Combined Effects on Adult Education*

WALL survey analysis of the combined effects of union status and organizational decision-making role on participation in adult education confirm that both retain significant effects and that their *additive* effect is even more pronounced. As Table 6 shows, union members with organizational decision-making roles are most likely to participate in adult education (64 percent), while non-union members without decision-making roles are least likely (36 percent). Both union members without decision making roles (53 percent) and non-union members with such roles (50 percent) have intermediate levels of participation in adult education. When odds ratios are adjusted for possible effects of age, sex and educational attainment, as well as sector and organization size, union members with job control are still two and a half times as likely to participate in adult education as non-union members without job control.

TABLE 6

#### **Combined Effects of Union Membership and Decision-making Role on Participation in Adult Education, Canada, 2004**

	<i>Adult Education (%)</i>	<i>Raw Odds</i>	<i>Odds*</i>	<i>Odds**</i>	<i>Odds***</i>
Non-Members					
Non-Participants	36.0	1	1	1	1
Participants	50.5	1.81 <sup>a</sup>	1.78 <sup>a</sup>	1.81 <sup>a</sup>	1.67 <sup>a</sup>
Union Members					
Non-Participants	53.3	2.03 <sup>a</sup>	2.02 <sup>a</sup>	1.80 <sup>a</sup>	1.55 <sup>a</sup>
Participants	64.0	3.15 <sup>a</sup>	2.91 <sup>a</sup>	2.83 <sup>a</sup>	2.44 <sup>a</sup>
Total	51.0				

Source: WALL, 2004; N = 2,895.

\* Odds ratios adjusted for age, sex, and educational attainment

\*\* Odds ratios adjusted for age, sex, educational attainment and sector (private/public)

\*\*\* Odds ratios adjusted for age, sex, educational attainment, sector (private/public) and organizational size

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### ***WORKERS' POWER AND INFORMAL LEARNING***

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The lack of prior empirical survey research on workers' informal learning is partly related to the elusive nature of such learning (Livingstone, 2006a). But, since informal learning has now been documented as constituting the bulk of workers' job-related training (Betcherman, Leckie and McMullen, 1997) and more inclusive lifelong learning is now regarded as strategic in knowledge-based economies (OECD, 1996), identification of differences in patterns of informal learning becomes increasingly pertinent.<sup>2</sup>

The 2004 WALL survey, building on the pioneering research of Allen Tough and the 1998 national survey of the research network on New Approaches to Lifelong Learning (NALL),<sup>3</sup> documented the informal learning of Canadian adults in considerable detail and confirmed that these practices constitute the hidden part of the "iceberg" of adults' learning (Livingstone, 1999, 2002). The WALL research has further confirmed the much greater extent of job-related informal learning—the vast majority report at least a few hours per week—than adult education course participation among workers, and the weak association of formal schooling and adult education participation with informal learning generally (Livingstone and Scholtz, 2006). For example, neither high school dropouts nor retired people—both of whom have low rates of course participation—become discouraged informal learners. Generally, informal learning can be done in a wide variety of times and places and is less constrained by institutional power differentials than more formal educational provisions.

Both the 2003 AETS and the 2004 WALL surveys estimated the extent of informal mentoring on the job. Both surveys found that around one-third of non-managerial employees indicated that they had sought advice from someone more knowledgeable to develop their job skills in just the past four weeks (Peters, 2004; Livingstone and Scholtz, 2006). No significant differences were found between union and non-union members in either survey. The WALL survey did find that those with greater workplace authority experienced a higher extent of such mentoring (43 percent versus 30 percent) but this difference disappeared when age and educational attainment were controlled. Younger, more highly educated workers were much more likely than older, less formally educated ones to seek advice

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2. There is considerable overlap between designated on the job training programs and the informal education and non-taught learning that workers do on their own. But the massive extent of the informal aspects of job-related learning is becoming increasingly evident (compare Center for Workforce Development, 1998).

3. For further information on the NALL research network, see <[www.nall.ca](http://www.nall.ca)>.

from more knowledgeable colleagues. These findings underline both that informal job-related learning is more pervasive than adult education course participation and that it is less contingent on workers' organizational power. Unionized workers may have greater capacity to negotiate general working conditions and adult education provisions with employers, but some form of mentoring of less knowledgeable by more knowledgeable workers is endemic to the labour process and to all workers' informal learning in virtually all workplaces.

However, there are some differences in job-related informal learning in terms of union status and workplace authority. Table 7 summarizes the only significant differences among 11 topics in the WALL survey, including learning new job tasks, computer skills and teamwork skills (see Livingstone, 2006b). Union members are significantly more involved than non-union members in informal learning related to health and safety and to workplace politics, as well as somewhat more likely to be involved in learning to keep up with new knowledge in their occupational field. Most predictably, those non-managerial workers with workplace authority are twice as likely as those without it to engage in informal learning of managerial skills. They are also more likely to be involved in learning to keep up with new knowledge in their occupational field, as well as learning about workplace politics and health and safety. Odds ratios adjusted for age, sex and educational attainment confirm that there are significant independent effects of workers' power on these specific aspects informal learning, especially union effects on informal learning about health and safety and workplace politics, and independent effects of workplace authority on informal learning to keep up with new knowledge and gain managerial skills.

As Table 7 also shows, the combined effects of union status and job control are again typically greater on these specific aspects of job-related informal learning. On health and safety, the issue found to be of greatest learning interest to Canadian adults (Livingstone, 1999) and to which unions generally have devoted major educational efforts, union members with workplace authority are most likely to engage in related informal learning (66 percent) compared to only a plurality of non-union members without job control (46 percent). Consistent with the earlier finding of no significant relationship between union status and delegated workplace authority, informal learning of managerial skills is not significantly affected by union membership. This suggests that management-led organizational cultures tend to be indifferent to union status in selecting workers to nurture for more formal supervisory roles—and that many union members informally engage in learning some of these skills regardless of management. Perhaps most pertinently, a large majority of union members with workplace authority are likely to be keeping up informally with new knowledge about their jobs



TABLE 7  
**Union Status and Decision-making Role Influences on Participation  
 in Aspects of Job-related Informal Learning (%), Canada, 2004**

	<i>Keep up with new knowledge</i>		<i>Organizational or managerial skills</i>		<i>Workplace politics</i>		<i>Health and safety</i>	
	(%)	Odds*	(%)	Odds*	(%)	Odds*	(%)	Odds*
Union Membership Status								
Non-Member	56.7	1	35.1	1	27.1	1	51.6	1
Member	62.9	1.22 <sup>a</sup>	37.8	1.10 <sup>ns</sup>	39.7	1.79 <sup>a</sup>	63.6	1.72 <sup>a</sup>
Participation in Decision-making								
Non-participant	51.1	1	25.4	1	29.8	1	54.3	1
Participant	70.4	2.10 <sup>a</sup>	48.5	2.72 <sup>a</sup>	39.1	1.49 <sup>a</sup>	62.0	1.40 <sup>a</sup>
Union Status / Decision Role								
Non-Member								
Non-Participant	48.5	1	24.4	1	22.4	1	46.8	1
Participant	65.8	1.91 <sup>a</sup>	46.4	2.71 <sup>a</sup>	33.5	1.74 <sup>a</sup>	57.2	1.55 <sup>a</sup>
Union Member								
Non-Participant	53.2	1.15 <sup>ns</sup>	26.3	1.11 <sup>ns</sup>	35.9	1.97 <sup>a</sup>	60.4	1.83 <sup>a</sup>
Participant	74.4	2.68 <sup>a</sup>	50.4	3.05 <sup>a</sup>	43.7	2.70 <sup>a</sup>	66.0	2.39 <sup>a</sup>
Total	59.9		35.9		34.0		57.8	

Source: WALL, 2004; N = 2895.

\* Odds ratios adjusted for age, sex, and educational attainment

(74 percent) compared to only a plurality of non-union members without job control (48 percent). If nurturing of more knowledgeable workers is the goal of “knowledge-based economies,” then encouraging both participation in organizational decision-making and unionization may be the most effective means.

But again it should be emphasized that in most respects, job-related informal learning activities are much more extensively engaged in by most workers than are adult education courses and there are generally few differences in level of participation by union status or workplace authority. Most job-related learning is endogenous learning closely related to the job and virtually all jobs entail continual informal learning.

### ***DISCUSSION AND CONCLUSIONS***

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Our review and analysis of the most recent Canadian and international survey evidence, focusing on comparable samples of core age (25 to 64) non-managerial employees, finds consistent support for a positive independent effect of union membership on both participation in adult education and on some aspects of job-related informal learning. The general recognition of unions in the workplace has a positive effect on the adult education of non-unionized employees and indicators of union presence should be included in future research. Workers’ participation in organizational decision-making is also found to have positive effects on workers’ learning. These two aspects of workers’ power also have additive effects on workers’ learning. All of these effects are sustained when taking account of other likely effects of formal educational attainment and age, as well as sex, organizational size and public/private sector. Hence, the main hypothesis of this paper, that workers who have more workplace power are more likely to engage in workplace learning, is confirmed—although much more generally for adult education courses than for informal learning activities which are more pervasive and less vulnerable to power relations. Of course, such cross-sectional survey findings cannot prove causality between workplace power and intentional learning. Much further research attention should be paid to longitudinal effects of changes in unionization and delegated workplace authority on workers’ intentional learning activities.

While participation in general adult education experienced exponential growth from 1960 to the early 1990s in Canada, participation rates since then may have been more irregular. As Table 1 showed, non-managerial employees’ participation in adult education courses was stable at around 50 percent in 1998 and 2004, according to the NALL and WALL surveys. Statistics Canada’s various findings suggest slight overall declines in the 1990s followed by gains in both specific job training and general adult

education more recently. The relatively disarticulated nature of Canada's adult education system (Government of Ontario, 2006), the comparatively low commitment of many Canadian employers to invest in workers' training (Betcherman, 1999) and increasing time and money barriers to adult education (Livingstone, Raykov and Stowe, 2001) may be contributing to creation of some threshold limits on greater participation. In any case, there is insufficient consistent recent data to confirm participation trends for non-managerial employees.

From 1960 to the early 1990s, union density increased, if only gradually, from around 30 percent to around 36 percent (Rose and Chaison, 2001). Since the early 1990s, union density has declined from about 36 percent to around 30 percent (Statistics Canada, 2005). The exponential growth in Canadians' formal educational attainment has been the major factor in increasing adult education involvement. However, the available survey-based trend evidence suggests that the recent decline in union density may have had a dampening effect on non-managerial workers' participation in general adult education in the current context of still increasing educational attainments. Whatever the overall recent trend in incidence of specific job-related formal training, Table 3 confirms that there is a positive association between union membership and such training. Recent comparative case study analyses of unionized service workers and industrial workers (Livingstone and Sawchuk, 2004) have found that workplaces in sectors with greater union density have continued to exhibit higher levels of both adult education generally and some job-related informal learning, and that union density is more pertinent than formal educational levels or varied managerial control models in predicting levels of adult education.

As previously noted, country-wide surveys have found that non-managerial workers' participation in organizational decision-making increased significantly from the 1980s to 2004, especially for industrial workers and service workers (Livingstone and Scholtz, 2006). Since participation in organizational decision-making is positively related to individual workers' learning, these increases in themselves would predict continuing significant increases in adult education rates and at least some aspects of informal learning. But there is at least some evidence that recent general adult education rates for non-managerial workers may have stood still at the same time as union density has declined.

The Canadian labour force is now one of the most highly formally educated in the world, workers' reported participation in organizational decision-making is increasing, and both formal educational attainment and decision-making roles remain positively related to adult education at the individual level. But, if general adult education participation rates of non-managerial workers now stand still while educational attainment

and delegated workplace authority continue to increase, workers' overall decreasing collective bargaining power may be a major impeding factor. This possibility raises troubling questions for the future of workers' adult education in Canada and beyond.

All signs are that workers' demand for adult education continues to be high in relation to perceived increases in job skill requirements. The 2004 WALL survey found that the vast majority of non-managerial workers (74 percent) felt that their jobs often required them to learn new skills, and a majority (61 percent) were planning to take adult education courses in the next few years (Livingstone and Scholtz, 2006). Workers have regularly expressed a very high priority for education and training in surveys, but there is also a persistent perceived lack of *sufficient* participation in decision-making and job design, the so-called "influence gap" (Diamond and Freeman, 2001; Freeman and Rogers, 1999; Kumar and Murray, 2002). The demand for adult education and the level of delegated workplace authority are similar among both unionized and non-unionized workers. Both unionized and non-unionized workers also report a similar influence gap. The effects of delegated workplace authority on general adult education trends may be of quite limited impact.

Prior Canadian studies argued that unionization rate is related to both influence over working conditions and access to training (Jackson, 2002). The present study confirms the relation between unionization and training opportunities but shows no significant relation between unionization and influence on organizational decision-making. Some aspects of worker empowerment may be largely illusory, at least in relation to adult education.

There is a longstanding and widespread consensus in Canada about the chronic shortage of skilled trades people (Canadian Apprenticeship Forum, 2004). Recent research finds that unionized workers have higher rates of participation in apprenticeship programs but that the general rate of completion of apprenticeships has been declining in recent years (Raykov and Livingstone, 2005; Skof, 2006). The only substantial programs to address this shortage successfully so far have been joint employer-union initiatives developed through open negotiations and shared control (Taylor and Watt-Malcolm, 2005). For both the pressing problem of skilled trades shortages and the objective of increasing adult education participation rates, such joint initiatives appear to be part of the solution.

Claims about the value or necessity of social partnerships between trade unions and employers to create a highly-skilled workforce for a "knowledge-based economy" abound throughout market-based societies. The 2002 British Employment Act, which established trade union learning representatives (ULRs) with statutory rights, is one of the more concrete

expressions of this shared interest between employers and unions, in an economy which now has a similar level of unionization to Canada. While these ULRs appear to have brought significant benefits to union members in terms of increased technical skills training, their success remains dependent on strong, supportive unions while employers have remained resistant or indifferent to them in a majority of workplaces, and workers' authority roles remain highly constrained (see Wallis, Stuart and Greenwood, 2005).

In virtually all advanced market economies, trade union movements grew in membership and achieved some form of institutionalized role in industrial relations and politics in the early post-WWII era, as educational attainments and participation in adult education also grew. Since the 1980s, virtually all these economies have experienced some increase in contingent labour forces, neo-liberal economic policies and decrease in union densities (Ebbinghaus and Visser, 1999). Limited comparative data are available to assess recent changes in adult education participation rates. But, throughout the post-WWII era, workers' participation in adult education has been highest in Scandinavian countries where union density has been highest and workers' delegated authority has also been more substantial, as indicated by the existence of forms of self-management and systemic consultation. In Sweden, for example, union density now remains around 80 percent (Swedish Trade Union Confederation, 2005), local employer-union forms of established consultation continue (Fahlbeck, 1999) and workers' adult education participation rates, by most recent estimates, continue to lead advanced market economies (CEDEFOP, 2003).

In general, the positive effects of workers' participation in organizational decision-making on adult education have been sustainable where such measures continue to complement strong union effects. The current analysis confirms the additive effect in Canada. But in Canada, with very high and increasing levels of workers' formal education and limited if increasing levels of delegated workplace authority, our more modest, declining union densities may be linked with little increase in adult education participation among non-managerial employees, as well as with increasing levels of underemployment in terms of education required to perform jobs (Livingstone, 1998; Livingstone and Raykov, 2005). The combination of workers' growing underemployment with increasing employer and government interest in "labour resource utilization" (Cameron, 2005) offers opportunities for the trade union movement in Canada to achieve gains in both organizational decision-making and adult education and training, both of which are declared high priorities of most unions (Kumar and Murray, 2002). Narrowing the "influence gap" between workers' skills and their actual job requirements with innovative, genuine forms of participatory decision-making could stimulate a virtuous circle between delegated

workplace authority, adult education and increasing union density. Such initiatives would likely have strong appeal to increasingly highly educated and underemployed younger workers.

In any event, the present study offers consistent recent individual-level evidence of positive separate and additive effects of union membership and organizational decision-making roles on participation in adult education and some aspects of informal learning. There are benchmarks here for much needed further research in emerging “knowledge-based economies.” More in-depth studies of specific forms of union participation and effective workplace authority roles in relation to workers’ learning practices (e.g., Olson, 2004) could aid in overcoming the current apparent dampening effects of declining union densities with limited workplace authority on adult education rates.

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## ***RÉSUMÉ***

### **Le pouvoir des travailleurs et l'apprentissage volontaire chez le personnel d'exécution : l'enquête repère de 2004**

Cet essai examine les relations entre le pouvoir des travailleurs et leurs activités d'apprentissage volontaires. Le pouvoir des travailleurs se définit ici en termes d'autorité négociée acquise par la syndicalisation et d'autorité déléguée par les employeurs pour participer à la prise de décision organisationnelle. L'apprentissage volontaire est perçu en termes de participation à des cours formels d'éducation aux adultes aussi bien qu'en termes d'apprentissage informel lié à l'emploi. Il n'y a eu que très peu d'études théoriques ou empiriques sur la relation entre le pouvoir des travailleurs et l'acquisition de connaissances. Mais ce sujet devient hautement important quand on pense à l'émergence publicisée de l'économie du savoir et au besoin supposé d'une main-d'œuvre plus instruite. L'hypothèse principale est à l'effet que les travailleurs qui ont le plus de pouvoir dans les établissements sont les plus en mesure de saisir les occasions de s'impliquer dans plusieurs aspects de l'apprentissage en milieu de travail.

L'étude antérieure la plus pertinente à notre sujet s'est intéressée aux relations entre la syndicalisation et la participation à diverses activités d'éducation aux adultes. Les conclusions des études antérieures sont réévaluées et leur absence de cohérence est attribuable avant tout à l'échantillonnage et aux différences au plan de la définition des concepts. En réalité, il n'y a pas eu de recherche empirique antérieure sur l'autorité déléguée aux travailleurs sur les lieux de travail et sur l'apprentissage lié à l'activité de travail.

L'analyse empirique effectuée ici est principalement basée sur une enquête canadienne sur l'activité de travail et la formation continue (voir <[www.wallnetwork.ca](http://www.wallnetwork.ca)>), la seule enquête à ce jour à se centrer sur l'éducation formelle et informelle des adultes. C'est une étude détaillée qui s'intéresse également au statut syndical et au rôle de décideur organisationnel. Les résultats sont analysés en regard de ceux d'une enquête de l'année 1998 portant sur l'éducation des adultes et l'apprentissage informel qui retenait aussi le statut syndical. L'analyse concerne des employés d'exécution dont l'âge varie entre 25 et 64 ans. En plus de l'analyse de l'enquête canadienne sur l'activité de travail et la formation continue, nous avons aussi pris en compte des données provenant de l'Enquête sur l'éducation et la formation des adultes de Statistique Canada de 2003 ainsi que des enquêtes pertinentes du Royaume-Uni et de la Californie.

Ces analyses démontrent l'effet positif et récurrent de l'appartenance syndicale sur la participation à l'éducation des adultes. La participation à

la prise de décision organisationnelle exerce également un effet positif et important sur la participation à l'éducation des adultes. Peut-être, et c'est ce qui apparaît le plus significatif, ces effets sont-ils cumulatifs : les membres des syndicats qui ont une délégation d'autorité sur le lieu de travail présentent les taux de participation les plus élevés, alors que les membres non syndiqués sans autorité déléguée ont les taux les plus bas. Ces observations demeurent significatives lorsqu'on tient compte des variables telles que le degré atteint en éducation des adultes, l'âge et d'autres variables de contrôle.

L'apprentissage spontané et volontaire est beaucoup plus répandu que l'éducation formelle des adultes et échappe aux contraintes des relations de pouvoir institutionnel. Cependant, quelques aspects de l'apprentissage spontané sur le tas semblent entretenir une relation significative avec le pouvoir des travailleurs. Les membres d'un syndicat sont plus susceptibles de s'impliquer dans une activité d'apprentissage dont les enjeux sont la santé et la sécurité aussi bien que la politique interne, alors que ceux qui ont une fonction d'autorité déléguée sont plus susceptibles de s'adonner à des activités d'apprentissage liées à l'acquisition d'habiletés managériales et organisationnelles; deux modèles qui sont tout à fait prévisibles en termes de dispositions faisant l'objet d'une négociation avec le syndicat et en termes d'une prise de décision de caractère organisationnel. Mais l'appartenance syndicale et également les fonctions liées à une délégation d'autorité sur les lieux de travail ont des effets positifs sur l'apprentissage informel qui consiste à se tenir à jour dans son domaine occupationnel, et ces effets sont cumulatifs. Les membres d'un syndicat qui exercent des fonctions d'autorité déléguée présentent le taux de participation le plus élevé dans un effort de maintenir à jour leurs connaissances en lien avec leur occupation.

L'hypothèse de base d'une association positive entre le pouvoir des travailleurs et une plus grande propension à l'apprentissage volontaire est en règle générale confirmée. Les implications de ces observations doivent être envisagées dans le contexte général canadien d'un déclin de la densité syndicale et de l'augmentation de l'implication des travailleurs dans des formes limitées de prise de décision organisationnelle, de même qu'en tenant compte de l'insuffisance de données sur les changements récents dans les taux de participation à l'éducation des adultes chez les travailleurs non cadres. Les conclusions fondamentales de cette étude, tout comme les comparaisons internationales, laissent croire que dans les établissements où les syndicats sont bien accueillis et où l'implication des travailleurs dans la prise de décision organisationnelle est encouragée, l'apprentissage volontaire chez les travailleurs est susceptible d'atteindre un sommet. Ces conclusions fournissent des points de repère pour l'éclosion d'études sur l'apprentissage sur le tas au moment où le travail de traitement de l'information et la formation continue deviennent le noyau de la vie économique.