

Archived Information

Literacy Proficiency and Lifelong Learning

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Introduction

This chapter focuses on some of the important lifelong learning contexts and processes among adults in OECD countries. The focus will be on lifelong learning in one core subpopulation: native-born adults, age 16–55, who are native speakers of a national language of their country. This group will be referred to as the “core population” in this chapter. By excluding the elderly, the immigrant, and the nonnative speaking adults from this core population, we are *not* assuming that issues of lifelong learning and basic skills necessarily differ among these more specialized groups; we are merely focusing on one of the core groups in need of lifelong learning support. Other chapters in the volume consider issues specifically faced by the immigrant, nonnative speaking, and elderly adult populations.

Much of this chapter focuses on even a narrower subpopulation; namely, those meeting the above criteria *and* having relatively low levels of literacy proficiency as well. We will designate this special subgroup of our core population as the *low-proficiency population*. We are particularly interested in issues involved in lifelong learning for adults with low levels of literacy, since there is considerable reason to suppose that adults with relatively poor basic skills face particular problems as lifelong learners.

Figure 1 illustrates an important reason to pay particular attention to lifelong learning in adults at the lowest levels of literacy proficiency. These data are from the recent International Adult Literacy Survey (IALS), in which nationally representative samples of the adult populations from selected countries were interviewed and had their prose, document, and quantitative literacy abilities assessed; participating countries were members of the Organization for Economic Cooperation and Development (OECD). The bars show the percentage of adults in each participating OECD country that reported having taken some training or education during the year preceding the survey. These data are a measure of the breadth of lifelong learning in each society. Data shown in the figure are for our core population only, and are broken down according to assessed level of document literacy. The lighter shaded bar for each country displays the lifelong learning measure for low-proficiency adults (i.e., those at the lowest level of document literacy), whereas the darker bar shows the corresponding rate for adults at higher literacy levels. Although the figure shows that overall rates of lifelong learning vary markedly across countries, the same pattern can be seen within each country: low-proficiency adults generally participate at about half the rate as the rest of a country’s adult population.

Rubenson (1997) has argued that national adult education strategies based on United Nations Educational, Scientific, and Cultural Organization's (UNESCO) "Lifelong Learning for All" policy must be reconsidered carefully in terms of which adults are ready to learn and which adults benefit from lifelong learning within a particular society. As figure 1 indicates, not all of a country's adults appear equally prepared and/or motivated to engage in continued learning. In previous work with data from the United States, I found that a broad range of social and economic outcomes in the United States depend on individuals acquiring relatively high levels of both formal education *and* literacy (Reder 1995, 1998). As we shall see, the IALS results indicate that this general pattern occurs in many OECD societies: Both formal education and literacy proficiency are closely associated with individuals' life chances. Furthermore, youth who leave school with low levels of literacy are far less likely to participate in continuing education and training across their adult lifespans (OECD 1997).

Data Sources

The analyses presented in this chapter are based on three data sources. The primary data source is the IALS data from the first two rounds of country surveys (OECD 1997). Secondary analyses were conducted on the public-use dataset, consisting of a sample of 38,358 adults age 16 and above from the 12 participating OECD countries. Further technical description of the IALS design, instrumentation, assessment, and sampling techniques are available elsewhere (Murray, Kirsch & Jenkins 1998; OECD 1997, 1995). The core population of this chapter—native-born adults, age 16–55, who are native speakers of the language of the interview—comprised a subsample of 23,660 observations, representing 216 million adults or 66 percent of the IALS population. Many of the analyses further restrict this IALS subpopulation to the lowest level of assessed literacy proficiency, operationally defined here as those who score at Level 1 (below 225) on the Document Literacy scale (see Murray et al 1998, for further details). Individuals meeting the above criteria and in this subgroup are termed *low-proficiency adults* in this chapter. There are 33.7 million low-proficiency adults in the IALS sample, 15.6 percent of the core population for this chapter and 10.3 percent of the total IALS population.

The second data source is the National Adult Literacy Survey (NALS) conducted in the United States using instrumentation and procedures parallel to the IALS. Secondary analyses were carried out on the public-use data from the household component of this survey, involving a sample of 24,944 adults age 16 and above. The core population within NALS has a sample size of 17,346, representing 125 million adults or 66 percent of the NALS population. The low-proficiency adult component (as defined above) of the core population comprises 13.1 million adults, representing 10.5 percent of the core population for this chapter and 10.5 percent of the total NALS population. Kirsch, Jungeblut, Jenkins, and Kolstad (1993) provide further technical description of the NALS.

The third data source is employee records for manufacturing and assembly workers at Hardy Industries between 1992 and 1997. Hardy Industries (a pseudonym) is a privately held company that makes precision metal parts for the United States and international automotive industries.

The Hardy data are of interest here because they provide detailed information about employees learning a wide range of specific work-related skills. The data analyzed for this chapter are based on analysis of 5 years of detailed records for 130 manufacturing and assembly workers who were employed by Hardy throughout the 5-year period and who satisfy the criteria for our core population. Further details about the company, described ethnographically by Hart-Landsberg and Reder (1995), will be provided when data about worker learning are considered later in the chapter.

Organization of Chapter

The remainder of the chapter is organized into five sections. The next section sketches the socioeconomic contexts among OECD countries for lifelong learning in low-proficiency adults. The subsequent section delineates two major relationships underlying associations between literacy skills and education, processes termed “literacy development” and “literacy selection.” Although both literacy development and literacy selection processes are found in all OECD countries, their relative potency may well differ from country to country. An ensuing section looks at some characteristics of low-proficiency learners in the various OECD countries participating in the IALS. Three major contexts for basic skill development and lifelong learning are considered in the subsequent section: literacy training programs; workplaces; and interpersonal relationships. The final section offers some conclusions and recommendations for additional research and program and policy development.

Societal Context of Lifelong Learning for Low-Proficiency Adults

As a way of seeing the complex contextual relationship between literacy proficiency and education, let’s examine how economic success in the United States is linked to both formal education and literacy skills. Figure 2 shows annual earnings as a joint function of educational attainment (highest credential received) and document literacy level. These are NALS data for our core population (and include only those who had some earnings during the year preceding the interview). Notice the regular rise in median annual earnings with educational attainment for each level of literacy. Without a secondary credential, increasing levels of literacy do not appear to improve earnings. To earn incomes that can reasonably support a family, relatively high levels of both education and literacy proficiency are typically required. Similar patterns in the NALS data have been observed for a variety of other social and economic outcomes, in which attainment of moderate levels of social and economic outcomes seem to require both relatively high levels of skill and education (Reder 1995).

As pervasive as this pattern appears to be in the United States, it is not necessarily characteristic of other OECD societies. Although it is beyond the scope of this chapter to consider each country’s pattern in detail, a few contrasting examples will illustrate the international variation present. The same analysis of earnings shown in figure 2 with the NALS data is repeated with IALS data in figure 3 for the core population in the United States. Figures 4 and 5 display the corresponding IALS data for Sweden and Poland, respectively. Sweden and Poland are chosen as

examples here because they exhibited (recall figure 1) the highest and lowest rates of lifelong learning among the IALS countries. The dependent variable plotted in these figures is the mean quintile of income (scaled 1 through 5) within each country associated with combinations of educational attainment and literacy. The income quintile was the only measure of personal income made available in the public-use IALS datasets.

As expected, the U.S. data from IALS is similar in shape to that shown above for the NALS data. (Note that the right-hand corner bar in figure 3 does not reflect a stable estimate for this unusual combination of literacy and education within the United States, because the subsample size was too small.)

Parallel data for Sweden and Poland show a different pattern of earnings across the various combinations of education and literacy status. Like the U.S. data, earnings data in Sweden and Poland exhibit clear differentiation according to educational attainment. But neither society, in contrast to the United States, shows the clear pattern of outcomes according to literacy proficiency given a constant level of education. This does *not* indicate, of course, that literacy is unimportant in these outcomes, only that its socioeconomic correlates are fairly well captured by those of educational attainment. Although, as we shall see in the next section, literacy skills partially determine the amount of education that individuals receive in both Poland and Sweden, there appears to be relatively little residual effect of literacy on economic outcomes after the effects of education are controlled. This contrasts rather sharply with the situation in the United States, in which both education and literacy jointly determine a number of social and economic outcomes. It is clear from past research that education and literacy proficiency have different relative strengths as predictors of economic outcomes in the various OECD countries (OECD 1997).

There are several reasons why literacy proficiency and educational attainment could be jointly important as precursors of socioeconomic outcomes in the United States but not in some other OECD countries. One possibility is that there are substantial international differences in the extent to which nonschool experiences are associated with literacy growth. This might be the case, for example, if the extra-school influences on literacy development (e.g., influences of the home environment) are relatively stronger in some countries (e.g., the United States) than in other countries (e.g., Sweden, Poland). On the other hand, the same pattern of results might occur if correlations between the amount of schooling and literacy proficiency are markedly different among the countries. In the IALS data, however, the partial correlations between years of schooling and document literacy turn out to be roughly equivalent among the OECD countries (holding age constant). We will see further evidence in the section below that the relation between schooling and literacy is highly similar among these countries. It is therefore more plausible to think about the international differences in terms of the differential potency of nonschool factors in literacy development.

Literacy Development and Literacy Selection

Reder (1998) distinguished between two kinds of literacy processes underlying the strong positive correlation observed between educational attainment and literacy proficiency. On one hand, the more schooling individuals participate in, the more their literacy develops and the higher their proficiencies become. Reder terms this a “literacy development” process. On the other hand, literacy proficiency is often a gatekeeper that limits individuals’ access to educational opportunities; increasingly higher levels of education become increasingly selective in terms of their literacy requirements. This selective filtering of literacy proficiencies through the educational system is termed a “literacy selection” process by Reder, who notes that literacy often acts as a gatekeeper for access to both postsecondary education and various components of career ladders.

Figure 6 illustrates the effects of literacy development processes in the IALS data. Each line in the figure presents data from the core population of a given IALS country, plotting average document literacy proficiency against level of educational attainment. With few exceptions (occurring mainly at extreme points at which relatively little data is available for stable estimates), there is a close linear relationship between amount of schooling and literacy proficiency; the greater (lesser) the amount of schooling completed, the greater (lesser) the average literacy proficiency.

A critical feature of the data in figure 6 is that the curves for the countries are essentially parallel lines having about the same slope. This suggests that the differences among the countries’ literacy proficiency levels do not appear to result from different underlying patterns of literacy development in schools. The roughly parallel lines in the figure indicate that marginal increases in amount of schooling are associated with roughly equivalent gains in average literacy proficiency. Although the lines have roughly equal slopes, their intercepts are vastly different, resulting in relatively constant differences in literacy proficiency among the countries at any given level of educational attainment.

These results suggest that there are strong societal factors differentiating literacy levels among these countries, factors that are unrelated to the amount of schooling individuals receive. These factors combine additively with the effects of schooling on literacy, and are evidenced in the figure by the substantial differences in the intercepts of the countries’ parallel lines. The equal slopes of these lines are consistent with the equal magnitude correlations noted in the previous section.

Figure 7 replots these IALS data for the core populations in order to exhibit the relationship between schooling and literacy in a different way. Each line in the figure displays the average number of years of schooling attained by adults functioning at each level of document literacy. The more (less) literacy proficiency individuals have, the more (less) years of schooling they tend to complete. These can thus be interpreted as literacy selection curves from the various IALS countries. As in the previous figure, the essentially parallel nature of the lines has important implications for our understanding of the relationship between literacy and education in our core population. The parallel lines implicate factors unrelated to schooling that underlie the substantial international differences in adult literacy.

Although it is not possible to distinguish the relative effects of literacy development and literacy selection processes underlying the observed correlations between schooling and literacy presented in figures 6 and 7, the two processes can be statistically isolated by analytical techniques that utilize other variables as well. By applying structural equation models to the NALS data from the United States, Reder (1998) was able to estimate the relative strengths of the literacy development and literacy selection components underlying the positive correlation observed between years of schooling and literacy proficiency. In the models considered, there were reciprocal positive effects of literacy and education on one other, with the estimated magnitude of literacy development (i.e., the direct effect of schooling on literacy) being roughly three times as strong as the magnitude of literacy selection (i.e., the direct effect of literacy proficiency on schooling).

It seems reasonable to suppose that the various OECD societies differ in the relative salience of literacy development and literacy selection processes underlying their distributions of educational attainment and literacy proficiency. One reasonable hypothesis is that in a society such as the United States, in which postsecondary education has increasingly become accessible to individuals across a broad range of the literacy proficiency distribution (i.e., relatively low levels of literacy selection), other outcomes such as income will be sharply related to both educational attainment and literacy proficiency (figure 3). In societies offering less access to postsecondary education for those with relatively poor basic skills (i.e., stronger literacy selection), economic outcomes may be dependent primarily upon educational attainment and not *directly* upon literacy proficiency as well (figures 4 and 5 for Poland and Sweden, respectively).

Although the development of more effective educational and economic policies in OECD countries would likely be well served by modeling and evaluating their component literacy development and literacy selection processes, we cannot carry out a contrastive analysis of this type at present. The structural equation models Reder used with the NALS data from the United States unfortunately cannot be applied directly to the IALS data from other OECD countries because several of the key variables from NALS were not included in the IALS. Similar models could be developed that would contrast the relative potency of literacy development and literacy selection in these various societies. In the meantime, it will behoove policymakers in all countries to think carefully about the ways in which both literacy development and literacy selection processes influence the socioeconomic distribution of literacy proficiency in their societies.

Some Characteristics of Low-Proficient Learners

Previous sections considered some of the ways in which the socioeconomic distribution of literacy and education within a society influences the overall process of literacy development. But what do these societal-wide contexts and processes mean for the individual adult learner with poor basic skills? Let us consider some of the contextual variations among OECD countries for adults at the lowest level of document literacy. This section would, of course, be too long if it were to consider the full range and variation of distinctive characteristics of the low-proficient adults in the OECD countries. Space limitations here permit only a cursory sketch of a few illustrative characteristics. More detail is available elsewhere in this volume and in the OECD (1997, 1995).

Let us first consider the overall incidence of low-proficient adults within the core populations of the IALS countries. Figure 8 displays this international variation. Each bar represents the percentage of the core population performing at the lowest level of document literacy on the IALS assessment. The percentage of the core population in the low-proficient group varies widely across countries, ranging from about 5 percent of Sweden's core population to over 40 percent of Poland's.

The economic context of being a low-proficient adult also varies widely among these OECD countries. Figure 9 exhibits the income status of low-proficient adults relative to their own local economic standard. Each IALS country's income distribution was first estimated from survey data sampled from all working adults. Each country's resulting income distribution was then broken down into fifths (i.e., quintiles). Individual incomes reported by IALS respondents were then recoded into the appropriate quintile of the given country's income distribution, ranked from 1 (lowest) to 5 (highest). The mean income quintiles for low-proficient adults in each OECD country are displayed in figure 9. An average quintile score of 3.0 would indicate that low-proficient adults in a country have incomes at the average level for the entire adult population. Data in the figure indicate that this is approximately the case in both Sweden and Poland, whereas in other countries the majority of the low-proficient population is concentrated in the lower income quintiles (as is particularly evident in the United States and Belgium). The fact that Sweden and Poland, shown in previous figures to have diametrically opposed overall levels of literacy and rates of lifelong learning, both have relatively high levels of income for low-proficient adults is remarkable. Assertions that economic advancement is everywhere the main driver of lifelong learning are likely going to provide too simplistic an account.

Let us consider a different type of characteristic of low-proficient adults that may also be relevant to their experiences as lifelong learners. Figure 10 displays the incidence of self-reported learning disabilities among low-proficient adults in the IALS countries. (The figure omits those few countries that elected not to include the optional IALS questions about learning disabilities). Although such self-report is certainly not an infallible indicator of clinically identifiable learning disabilities, it appears to have a fair amount of validity as a research measure in large-scale surveys (Vogel & Reder 1998). Notice that the data shown in the figure are the percentages of self-reported learning disabilities among low-proficient adults in the core population, not the overall incidence of learning disabilities in the adult population. These percentages vary widely among the participating countries, ranging from 29 percent of the low-proficient core population in New Zealand down to 3 percent in Sweden. As a likely indicator of perceived internal barriers to adult learning, these self-report data seem to reflect widely varying personal contexts and perceived obstacles to literacy growth that face low-proficient adults in the various OECD countries.

Three Contexts for Lifelong Learning

Results in the above sections suggest that there are extra-school contexts in which individuals develop basic skills, and that international differences in these contexts—perhaps more than differences in their formal educational settings—are at the root of major differences in adult literacy among OECD countries. To illustrate these points in a different way, consider figure 11,

which displays the percentage of the core population *not* completing a secondary education that nevertheless develops relatively high levels of literacy (Level 3 or higher). For example, the figure indicates that in New Zealand about 30 percent of the core population that did not complete secondary school nevertheless attain document literacy Level 3 or higher.

The international differences among the IALS countries in figure 11 are profound. In some countries such as Germany and Sweden, of the core population that does not complete secondary school, about 50 percent have document literacy abilities at Level 3 or higher; at the other extreme, the corresponding figures for the United States and Poland are below 20 percent. These results remind us again that educational policy and programs must focus on factors beyond formal education if most of the core adult populations are to reach this standard of functional literacy.

The remainder of this section explores three potential contexts for such adult literacy development and lifelong learning: basic skills training programs; interpersonal relationships (especially relationships in which literacy assistance occurs spontaneously); and workplaces.

Basic Skills Training

Although there are significant numbers of low-proficiency adults in each of the IALS countries, the programmatic attention to improving basic skills varies widely among the countries. Only three of the participating IALS countries chose to include the optional questions about basic skills training in their surveys: Canada, the United Kingdom, and the United States. There is therefore only limited comparative information available about basic skills training in the IALS countries.

Overall, only a small percentage of the core populations of these three countries report having ever participated in basic skills training (other than in school): 11 percent, 5 percent and 12 percent of the core populations of Canada, the United Kingdom, and the United States, respectively. When these overall participation rates are displayed as a function of assessed literacy abilities, the pattern displayed in figure 12 emerges.

There is little apparent relationship between literacy level and previous basic skills participation evident for the three countries shown in figure 12. Previous researchers have found this lack of relationship between skill level and participation. Reder (1997) reported a number of logistic regression analyses of NALS data, predicting basic skills participation in terms of literacy proficiency, educational attainment and other variables. Neither literacy proficiency level nor educational attainment was a significant predictor. Kwang, Collins and Stowe (1997), analyzing data from the National Household Education Survey, similarly found that educational attainment did not predict participation in basic skills training unless GED preparation were isolated from basic skills training.

If neither educational attainment or literacy proficiency is a major determinant of participation, then what factors might be? Adult educators have long believed that individuals participate when programs meet perceived or felt needs for improved skills. Reder (1997), analyzing the NALS data, found that individuals' self-ratings of their own literacy skills were not a significant predictor of participation, casting doubt on the utility of felt needs as a determinant of participation. In the

present IALS data, this relationship can be examined for the three countries. Figure 13 displays the percent of the core populations that reported ever participating in basic skills training as a function of their self-rated satisfaction with their skills. In each of the three countries, there is a substantial increment in previous participation rates when individuals report being “very dissatisfied” with their skills. The form of the self-rating question asked in IALS, one that directly tapped individuals’ level of satisfaction with their basic skills, appears to be a much better predictor of participation than the self-rating question asked in NALS, one that asked directly for self-ratings of proficiency.

Figure 14 displays another potentially important factor underlying participation in basic skills training. For each of the three countries, the percentage of the core population reporting having ever participated in basic skills training is shown as a function of whether they had received training for job- or career-related purposes. Particularly in Canada and the United States, adults who engage in work-oriented learning activities are far more likely to participate in basic skills training. Unfortunately, we are not able to examine this relationship in the other IALS countries at the present time, but this is clearly a topic in need of additional research. In addition to confirming this relationship for other OECD countries, it would be very useful to know more about how basic skills and job- or career-related learning activities are related. In particular, it would be important to know whether the basic skills training was offered in conjunction with or separately from the work-related training, and whether and how low-proficiency adults were effectively included in such arrangements.

Interpersonal Relationships: From Helping to Teaching to Learning

Previous research has suggested another important factor that may underlie participation in basic skills programs: the extent to which individuals receive assistance from others in performing everyday literacy tasks (Reder 1997; Reder & Green 1985; Wikelund, Reder & Hart-Landsberg 1992). An earlier statistical analysis of this relationship was conducted with the NALS data (Reder 1997). Adults reported how much help they received from family members and friends with five common literacy tasks: filling out forms; reading or understanding newspapers or other written information; understanding printed information from government agencies, companies and businesses; writing notes and letters; and using basic arithmetic in filling out such things as order forms, and checkbooks. For analytical purposes, individuals who indicated they received “a lot” (as opposed to “some,” “a little,” or “none”) of help on one or more of these tasks were designated by Reder (1997) as not being *literacy-sufficient*; 17 percent of all adults were *not* literacy-sufficient, whereas 83 percent of adults were. Further analyses found that self-sufficiency in everyday literacy activities increased regularly with both educational attainment and literacy proficiency. When *literacy-sufficiency* was added to the aforementioned logistic regression analysis of participation in basic skills training, it was a statistically significant predictor within the NALS data set (Reder 1997). A very substantial fraction (38 percent) of low-proficiency adults received regular assistance from individuals whom Reder and Green (1985) termed “literacy helpers.” Such naturally existing patterns of collaboration may be strategic contexts for adult literacy development.

Figure 15 displays some related data for the core populations of the IALS. The percentage of adults reporting that they “often” received help from friends or family members with everyday literacy tasks is shown for each country. There is perhaps somewhat less variation here among the IALS countries than in some of the other data we examined above; in most of the countries, between 10 and 20 percent of the core population reports often receiving help from friends and family members on everyday literacy tasks.

For the three countries that included information about basic skills participation, figure 16 exhibits the relationship between participation and receiving help with everyday literacy tasks. The positive association between participation and assistance appears to be confirmed by the data in the figure, though the relationship appears weakest in the IALS data from the United States. Larger sample sizes and data from additional IALS countries are needed to extend this line of research. Considering the positive findings from the previous research, there continues to be good reason to explore ways in which to link literacy-assistance relationships with programmatic efforts to increase adult literacy.

Workplace Learning

We saw above in figure 14 that there may be an important relationship between work-related learning in general and participation in basic skills training. Since adults spend so much of their everyday time in workplaces, it is essential that policies and programs be developed for the workplaces that facilitate adult literacy development and lifelong learning. To demonstrate the potential of the workplace as a learning context in which concerted efforts by employers can result in widespread learning and development, this section presents some data from an innovative company in the automotive industry that we will call Hardy Industries. Hardy manufactures specialty parts like locking hubs, winches, and other specialty components for both domestic United States and international customers, including automakers and after-market retail customers. Hardy has innovated a number of significant changes in its manufacturing and assembly processes and technologies as well as a skill-based compensation system that are of particular interest to us here. Detailed ethnographic accounts of Hardy and these innovations are available elsewhere (Hart-Landsberg & Reder 1995). A detailed description of the compensation system, termed “Pay-for-Knowledge (PFK),” is available in Reder (in press).

Hardy designed its PFK compensation system in order to create direct financial incentives for employees to acquire new work-related skills and knowledge, including a range of functional literacy skills such as blueprint reading, gauge reading, shop, math, and introductory statistical process control. Hardy carefully developed a matrix of skills that it believed to be essential not only for immediate production purposes but also for increasing flexibility, adaptability, and lifelong learning among its manufacturing and assembly workers. The PFK skills were classified into one of five levels of difficulty (termed “skill blocks”), voluntary training courses were developed for many of the skills, and careful assessment criteria and instruments were developed for certifying acquisition of each skill. Workers received a flat base hourly wage plus increments based on the number and difficulty level of PFK skills they could demonstrate mastering. Skills at the highest difficulty level were worth more than those in the next lower level, and so forth.

Workers able to acquire the maximum number of PFK skills could earn approximately three times the base pay.

Data shown in the following series of figures pertain to Hardy's manufacturing and assembly workers who meet the criteria for the core population studied in this chapter. Figure 17 displays over a 4-year period from 1993–97 the average number of skills acquired by these workers at each PFK "skill block" level. The same set of 130 workers is shown for each year. Steady learning of work-related skills is evident at all levels of difficulty.

Figure 18 shows the overall growth in the total number of PFK skills per worker and the associated increases in their average hourly wage. It is important to emphasize that Hardy Industries was not trying to be charitable to its workers through this very expensive compensation system; it chose to deploy a competitive strategy based on increasing its workers' skills and this strategy appears to have been extremely successful. Workers have participated actively in learning, their skills have grown, their wages have correspondingly increased dramatically, and the company has competed successfully and has expanded considerably during this period of time.

Figure 19 displays the PFK learning curves of these manufacturing and assembly workers according to whether they had high school (or equivalency) diplomas. It is very important, in evaluating the potential of such workplace interventions to promote lifelong learning for all workers, to note that the low-education workers have been well served by and responded well to these innovations designed to support learning. Statistical analyses of these data, controlling for demographic variables and job-tenure, indicate that there were no significant effects of education level on the learning of these work-related skills.

Though formal training was available for many of the PFK skills, participation in training was voluntary for most courses and many workers acquired skills through a variety of informal means (Hart-Landsberg & Reder 1995; Reder, in press). Figure 20 displays the relationship between formal training and learning of specific skills. The particular skills displayed in figure 20 were chosen for this analysis because they are clearly workplace literacy skills, and ones for which specific training courses were available on-site at Hardy: blueprint reading, gauge reading, shop math, and introductory statistical process control.

For each skill shown in figure 20, three bars are displayed about workers' development of the given skill during the first year of the PFK implementation at Hardy. The left-hand bar in each group shows the percentage of workers who chose to take the training offered for the particular skill. The middle bar displays the percentage of workers who took the given training that acquired the given PFK skill. The right-hand bar shows the percentage of workers who did *not* take the training that acquired the given PFK skill. For example, about 63 percent of the workers took the blueprint reading course; 79 percent of those who took the course acquired the blueprint reading skill, whereas only 37 percent of the workers who did not take the course acquired the skill. Statistical analyses of these data indicate that a significantly higher percentage of workers

taking the training acquired the skill than of those not taking the training, with the exception of shop math, for which the two rates of skill acquisition are statistically equivalent (Reder, in press).

These results from Hardy indicate that, given both incentives to learn and training opportunities, many workers will learn and develop work-related literacy skills. Furthermore, although formal training may be relatively effective for many workers, many other workers choose to learn and do learn through more informal means. For some skills, informal and formal approaches to learning may be equally effective. Such programs can offer effective opportunities and contexts for lifelong learning even for low-education workers.

Summary and Conclusions

Adults need both well-developed literacy abilities and educational credentials to advance socially and economically in the IALS societies. In some countries, a policy focus on educational attainment may be sufficient, whereas in other societies, such as the United States, advancement seems to require a focus on increasing literacy proficiency even after education is taken into account. The underlying differences among countries are likely related to differences in what have been termed “literacy development” and “literacy selection processes.” Further research in this area will be very helpful in understanding how to attain more equitable distributions of adult literacy.

There is considerable evidence that formal education is only one of the contexts in which adult literacy develops. The dramatic differences in adult literacy observed among the IALS countries may be more closely related to differences in these extra-school contexts and processes than to differences in their formal educational systems. Three contexts deserving further research and consideration in this regard include basic skills training, interpersonal relationships (especially those providing “literacy help”), and workplaces.

Previous adult education research in the United States suggests that participants in basic skills programs are diverse and constitute a microcosm of the wider society. A small and relatively constant proportion of adults with any given combination of levels of literacy proficiency and educational attainment participate, seeking to improve their skills (Reder 1997). This suggests that some formal literacy education programs for adults could be effectively designed as part of broader society-wide efforts to improve literacy rather than as remedial programs only for low-proficiency adults. The observed relationships between participation in basic skills programs and work-related learning, as well as between participation and getting help from friends or family members with literacy tasks, point to some promising new directions for serving broader audiences of lifelong learners. Since most spells of participation in basic skills programs are quite brief, it may be especially effective to design programs as supports for literacy development as a lifelong learning process. Certainly the results from innovative companies like Hardy Industries suggest some practical approaches and lines of experimentation that could be effective with low-education adult learners.

Providing specialized services to low-proficiency adults does not require that lifelong learning initiatives be implemented through programs that segregate or otherwise differentially treat adults with poor basic skills. Not all of the OECD countries participating in IALS have well-developed national adult literacy education programs. Indeed, among the dozen countries participating in the first two rounds of the IALS, only three (Canada, England, and the United States) chose even to include the optional questions in their surveys about basic skills training.

During the OECD/U.S. Department of Education cosponsored conference, “How Adults Learn,” there was sharp disagreement and debate among countries and individuals over how best to connect literacy education programs for low-proficient adults to broader initiatives and programs seeking to facilitate lifelong learning throughout society. Certainly if the two types of programs remain separate entities as they currently are in some countries, they will likely have different relative priorities among the various OECD countries, given the vastly different concentrations of low-skilled adults among the various countries.

Even in contexts where there is good reason to advocate for services and resources targeted to the particular needs of adult learners needing better basic skills, it should not be assumed that *all* such resources and services should be delivered in contexts which segregate low-skilled adults from other adult learners. Participation research in adult literacy education indicates the need for policies and programs that infuse learning support into diverse contexts and activities in which long-term engagement in basic skills development and lifelong learning are feasible (Wikelund et al. 1992). Some promising approaches suggested in this chapter include harnessing relationships between learners and literacy helpers and innovating new types of policies and programs within workplaces. No doubt approaches grounded in other contexts and institutions within communities will emerge as well. The challenge will be to find effective and appealing ways of including active support for adult literacy development within some of these newer settings and approaches while continuing to actively support the more established types of basic skills programs.

Figure Captions

Figure 1. Lifelong learning and literacy. The percentage of adults who have taken formal training or education courses during the preceding year is displayed in relation to their document literacy level. Includes adults who are age 16-55, born in the surveyed country and native speakers of the language of the interview. Source: International Adult Literacy Survey, author's calculations.

Figure 2. Earnings by literacy and education (USA). Median personal income for year preceding survey, plotted as a function of highest educational credential and document literacy level. Includes adults who are age 16-55, born in the United States, native speakers of English and not currently students. Source: National Adult Literacy Survey, author's calculations.

Figure 3. Wage Income by literacy and education (USA). Mean personal income quintile (1-5) within each country is plotted by highest educational credential and level of document literacy. Includes adults who are age 16-55, born in the surveyed country and native speakers of the language of the interview. Excludes individuals still in school and those without any personal income. Note sample size is too small to calculate a reliable estimate for lower right-hand bar. Source: International Adult Literacy Survey, author's calculations.

Figure 4. Wage Income by literacy and education (Sweden). Mean personal income quintile (1-5) within each country is plotted by highest educational credential and level of document literacy. Includes adults who are age 16-55, born in the surveyed country and native speakers of the language of the interview. Excludes individuals still in school and those without any personal income. Note sample sizes are too small to calculate reliable estimates for Level 1 bars. Source: International Adult Literacy Survey, author's calculations.

Figure 5. Wage Income by literacy and education (Poland). Mean personal income quintile (1-5) within each country is plotted by highest educational credential and level of document literacy. Includes adults who are age 16-55, born in the surveyed country and native speakers of the language of the interview. Excludes individuals still in school and those without any personal income. Source: International Adult Literacy Survey, author's calculations.

Figure 6. Document literacy as a function of educational attainment. Includes adults who are age 16-55, born in the surveyed country and native speakers of the language of the interview. Source: International Adult Literacy Survey, author's calculations.

Figure 7. Years of schooling as a function of document literacy. Includes adults who are age 16-55, born in the surveyed country and native speakers of the language of the interview. Source: International Adult Literacy Survey, author's calculations.

Figure 8. Percent of adults at lowest level of document literacy (Level 1). Includes adults who are age 16-55, born in the surveyed country and native speakers of the language of the interview. Source: International Adult Literacy Survey, author's calculations.

Figure 9. Mean personal income quintile (1-5) of low-proficiency adults. Includes adults who are age 16-55, born in the surveyed country, native speakers of the language of the interview and functioning at the lowest document literacy level. Excludes individuals still in school and those without any personal income. Source: International Adult Literacy Survey, author's calculations.

Figure 10. Learning disabilities among low-proficiency adults. The percentage of adults self-reporting learning disabilities is shown. Includes adults who are age 16-55, born in the surveyed country, native speakers of the language of the interview, and scoring at the lowest document literacy level. Source: International Adult Literacy Survey, author's calculations.

Figure 11. High literacy with little formal education. Displays the percentage of adults not completing secondary education who function at Document Literacy Level 3 or above. Includes adults who are age 16-55, born in the surveyed country and native speakers of the language of the interview. Source: International Adult Literacy Survey, author's calculations.

Figure 12. Basic skills training and level of literacy skills. The percentage of adults who have ever participated in basic skills training (other than school) as a function of their document literacy proficiency. Includes adults who are age 16-55, born in the surveyed country and native speakers of the language of the interview. Source: International Adult Literacy Survey, author's calculations.

Figure 13. Basic skills training and satisfaction with literacy skills. The percentage of adults who have ever participated in basic skills training (other than school) is displayed as a function of their satisfaction with their own reading and writing skills. Includes adults who are age 16-55, born in the surveyed country and native speakers of the language of the interview. Source: International Adult Literacy Survey, author's calculations.

Figure 14. Basic skills training and workplace learning. The percentage of adults who have ever participated in basic skills training (other than school) is shown as a function of receiving training for job- or career-related purposes. Includes adults who are age 16-55, born in the surveyed country and native speakers of the language of the interview. Source: International Adult Literacy Survey, author's calculations.

Figure 15. Literacy assistance among low proficiency adults. Displayed is the percentage of adults "often" receiving reading and writing help from family members or friends on one or more everyday literacy tasks. Includes adults who are age 16-55, born in the surveyed country, native speakers of the language of the interview, and scoring at the lowest document literacy level. Source: International Adult Literacy Survey, author's calculations.

Figure 16. Basic skills training and literacy assistance among low-proficiency adults. The percentage is shown of adults who have ever participated in basic skills training (other than school) as a function of "often" receiving reading and writing help from family members or friends on one or more everyday literacy tasks. Includes adults who are age 16-55, born in the

surveyed country, a native speaker of the language of the interview, and scoring in the lowest document literacy level. Source: International Adult Literacy Survey, author's calculations.

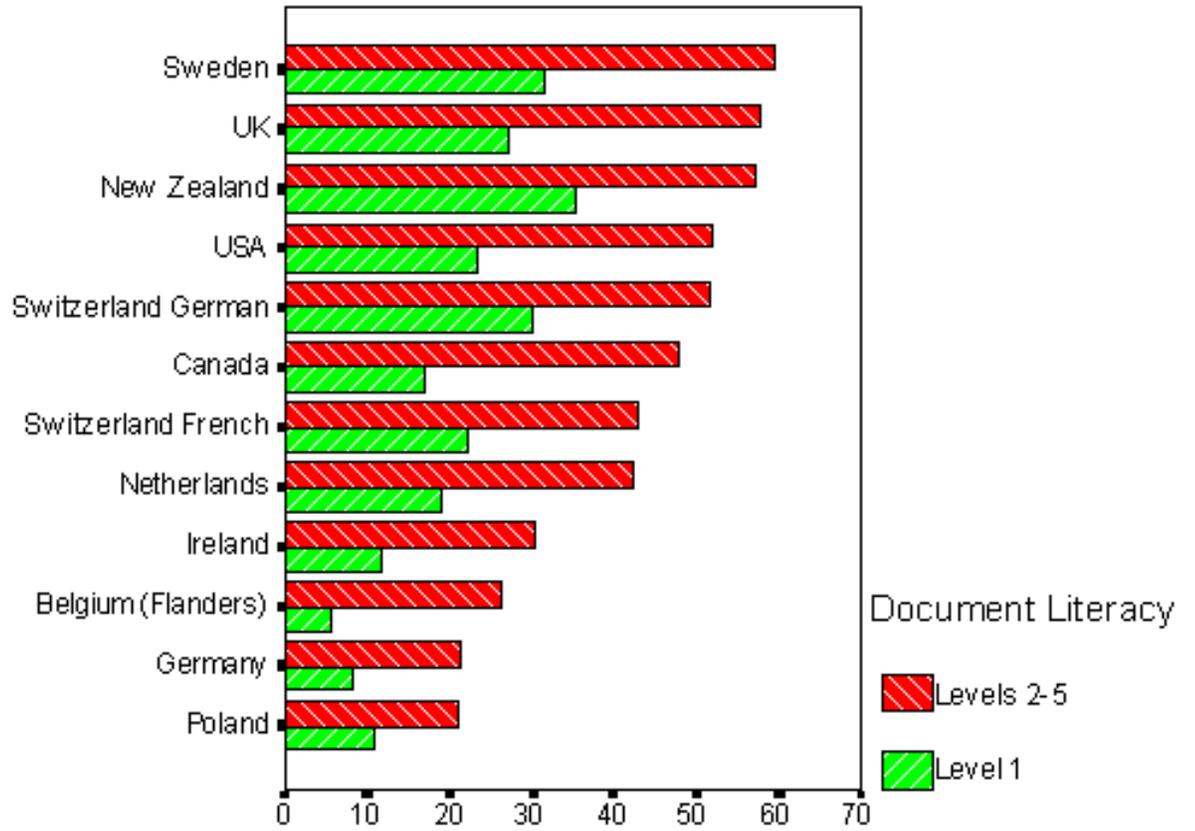
Figure 17. Skill acquisition in a workplace. The acquisition of work-related skills is shown over a 5-year period for manufacturing and assembly workers in Hardy Industries. Data are shown for the same set of workers at each time point. The five curves correspond to skills in different "blocks" or levels of complexity, with Block 5 consisting of the most complex skills.

Figure 18. Learning and earning in a workplace. The parallel growth of skills and wages are shown over a 5-year period among manufacturing and assembly workers in Hardy Industries. Data are shown for the same set of workers at each time point. Each curve is plotted against a different axis: Hourly wages ("PFK") is shown in U.S. dollars on the left ordinate; the total number of PFK skills acquired is displayed on the right ordinate.

Figure 19. Education and learning in a workplace. Average skill-based wages in a pay-for-knowledge (PFK) compensation system are shown (in US \$/hr.) over a 5-year period for manufacturing and assembly workers in Hardy Industries. Data are shown for the same set of workers at each time point. The two curves are for subsets of workers with and without high school or equivalency diplomas.

Figure 20. Formal and informal learning in a workplace. The chart shows the acquisition of four specific skills over a one-year period among manufacturing and assembly workers at Hardy Industries. Formal training courses were offered for each of these skills. The percentage of workers participating in associated training is displayed in the left bar for each skill. The percentage of workers taking the training who learned the skill is displayed in the middle bar for each skill. The percentage of workers who did not take the training who learned the skill is displayed in the right bar for each skill

Figure 1. -- Lifelong learning and literacy



Percent Taking Training or Education in Past Year

Figure 2. --Earnings, by literacy and education in the United States

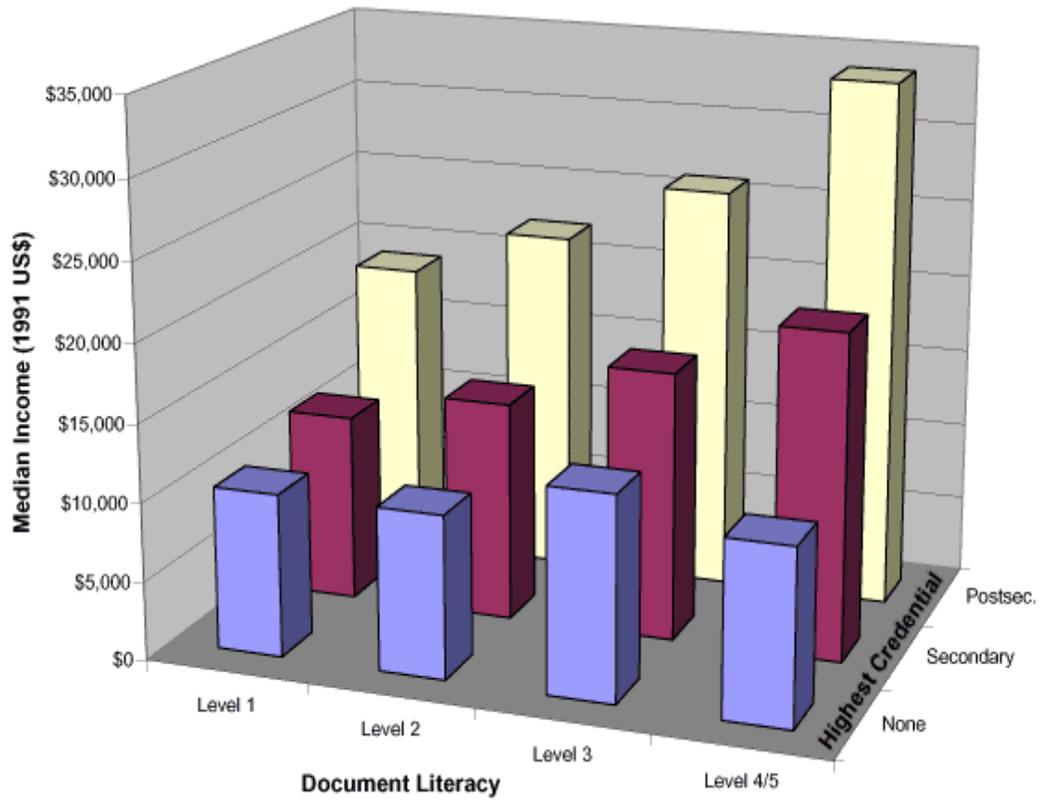


Figure 3. -- Wage income, by literacy and education in the United States

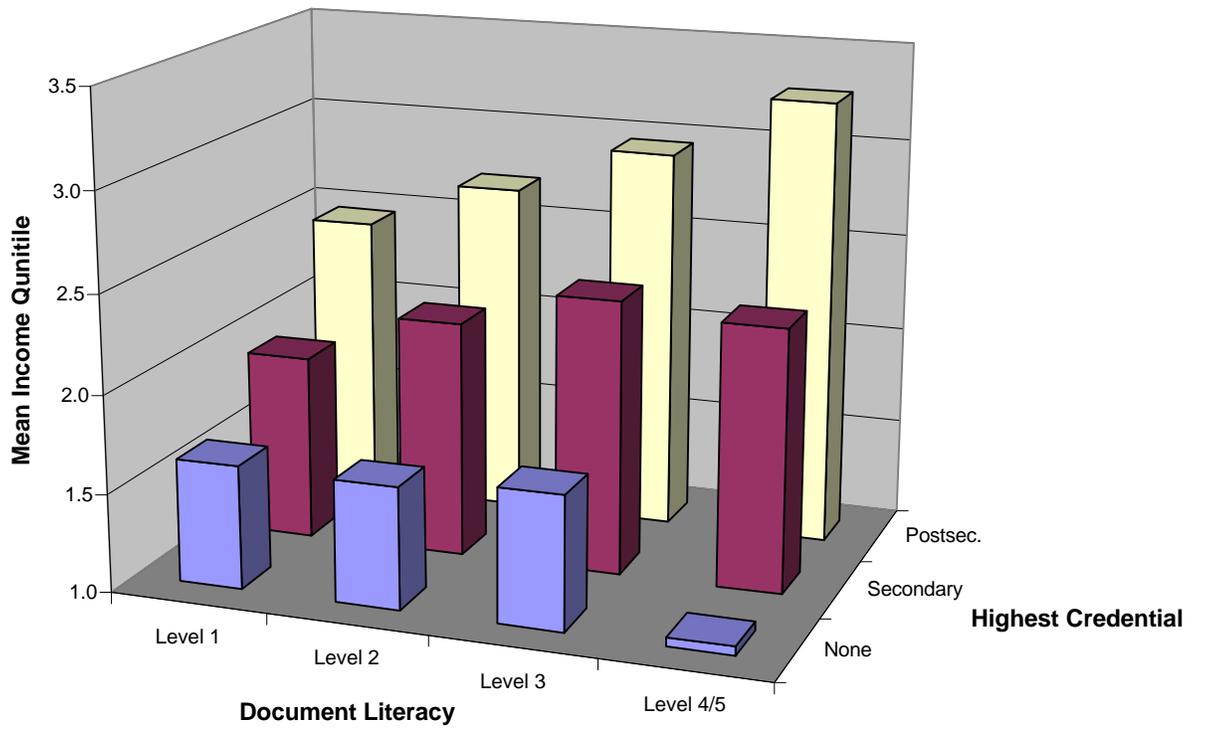


Figure 4. -- Wage income, by literacy and education in Sweden

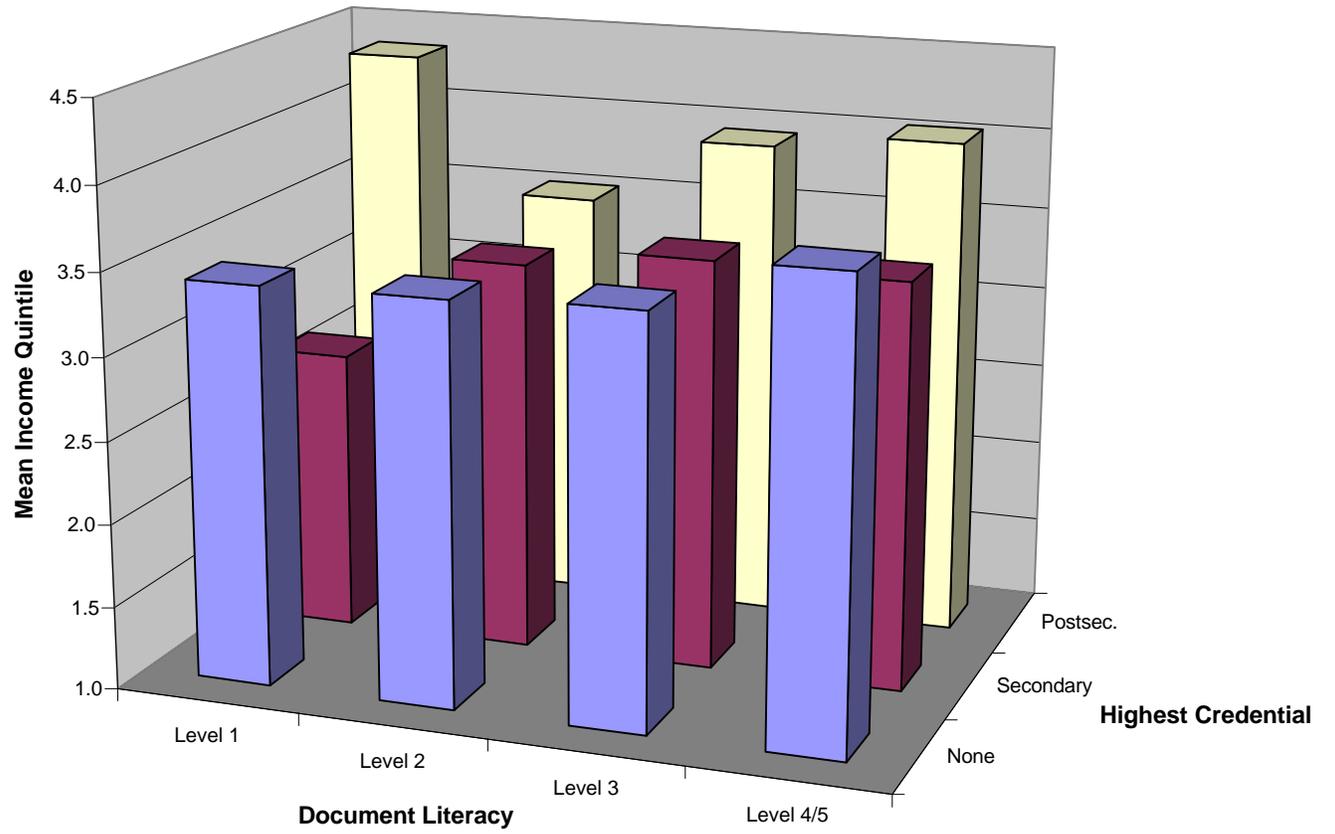


Figure 5. -- Wage income, by literacy and education in Poland

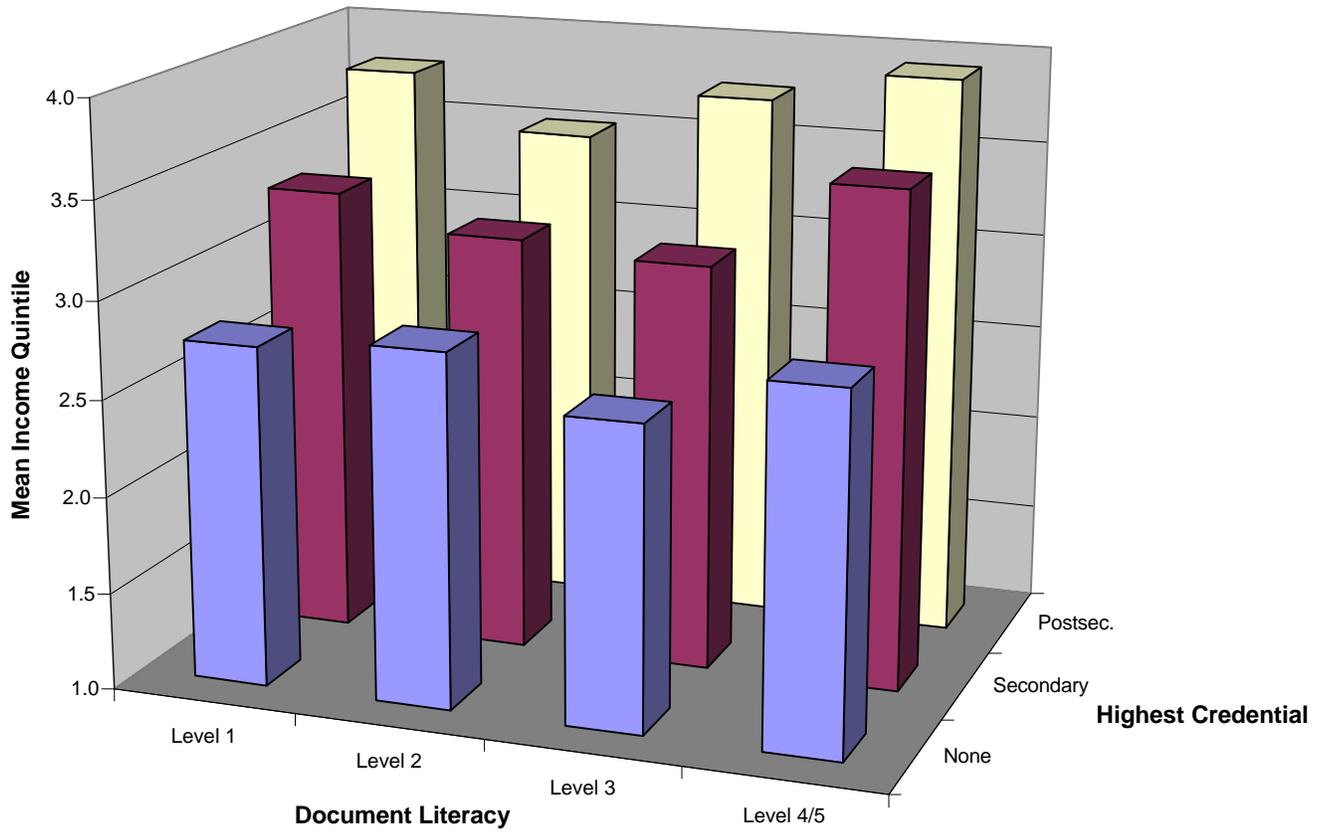


Figure 6.—Document literacy as a function of educational attainment

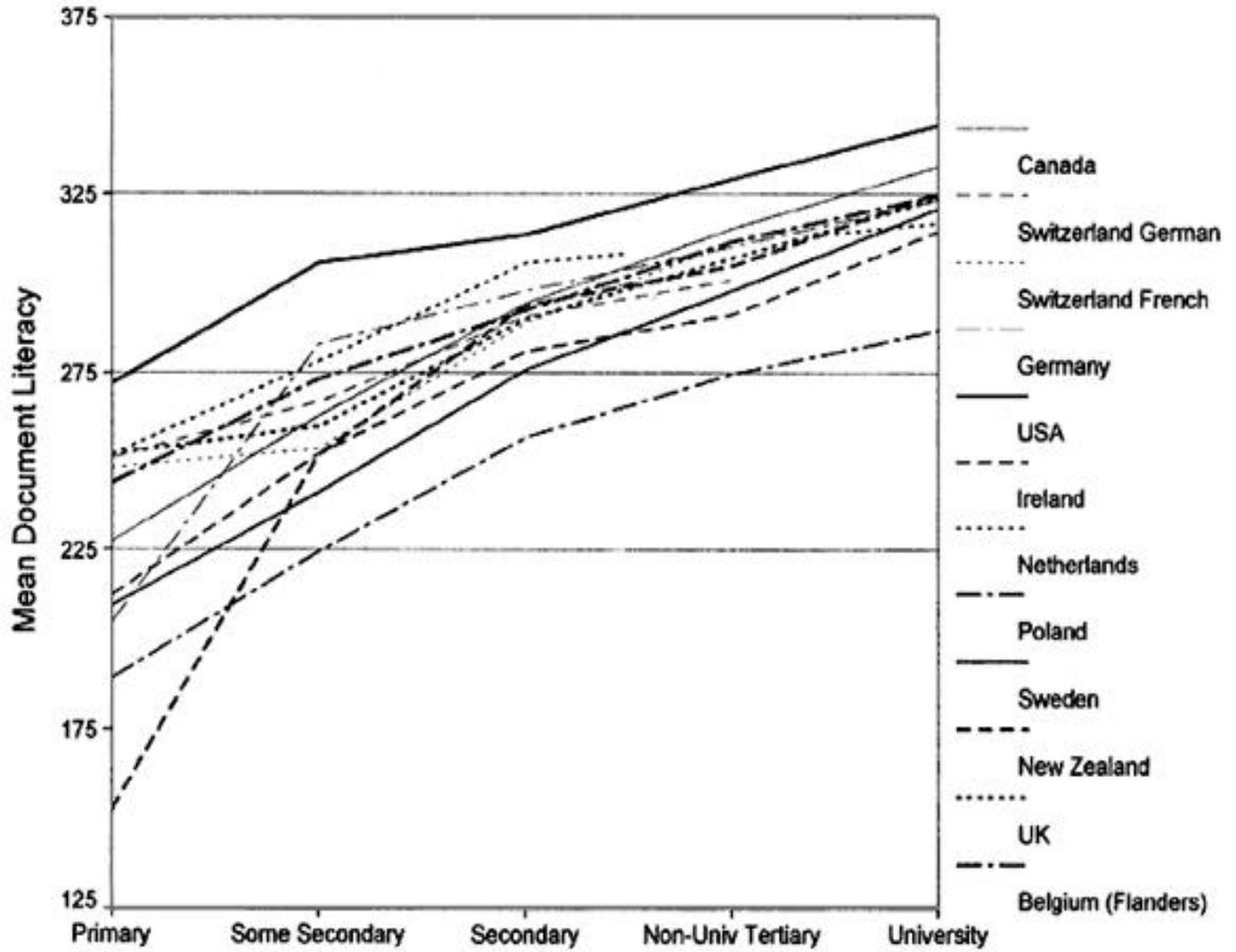


Figure 7. -- Years of schooling as a function of document literacy

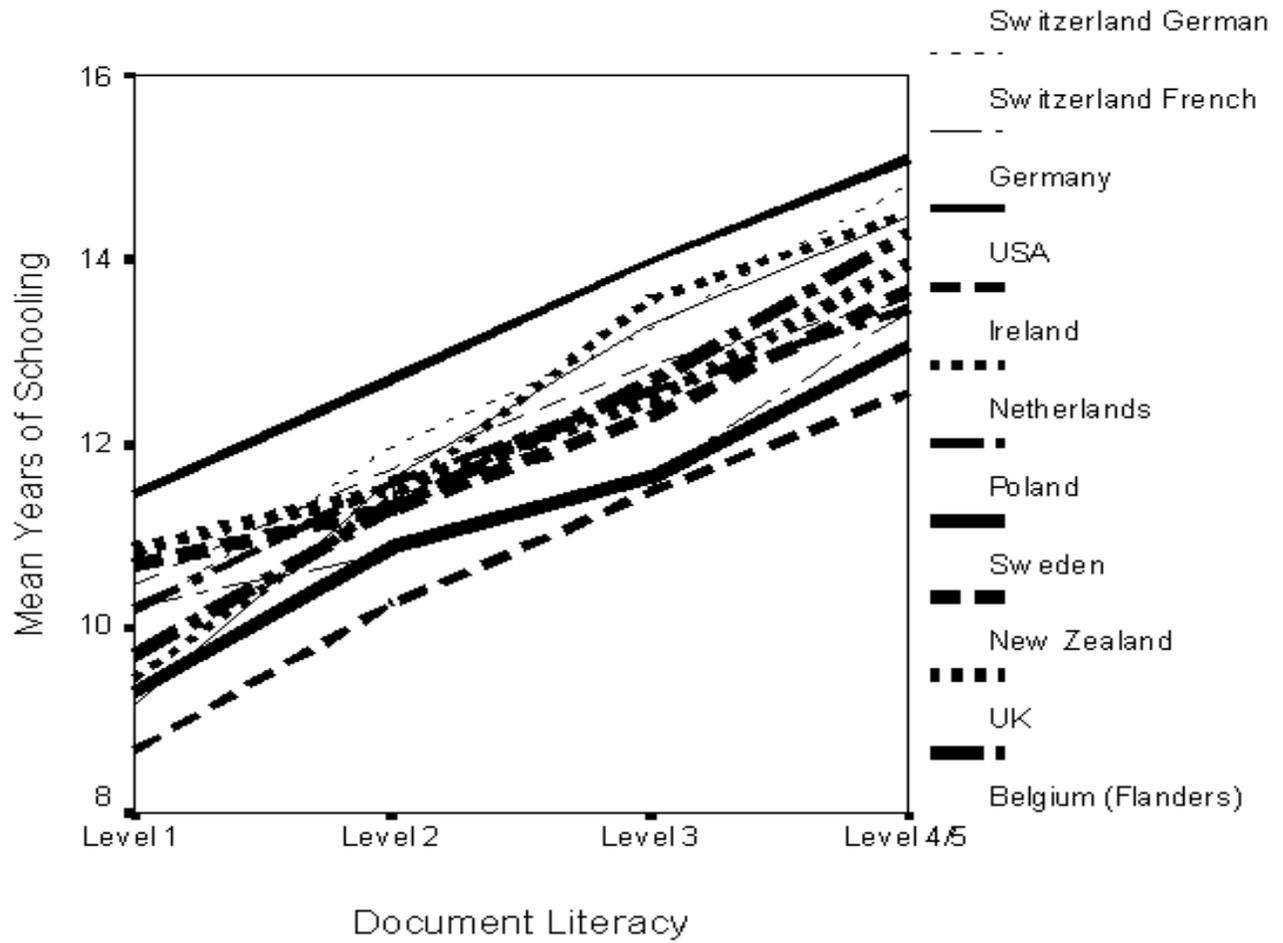


Figure 8. -- Percent of adults at lowest level of document literacy

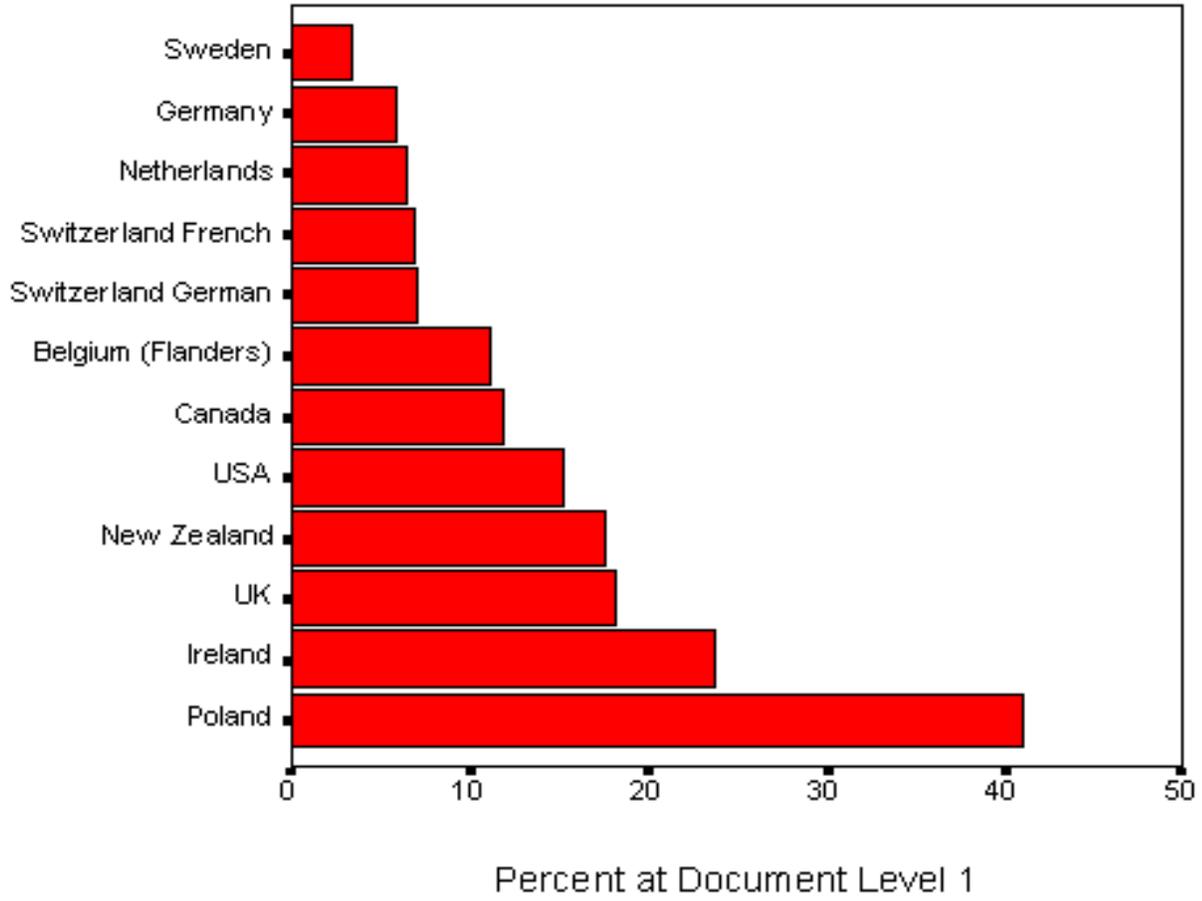


Figure 9. -- Mean personal income quintile (1-5) of low-proficiency adults

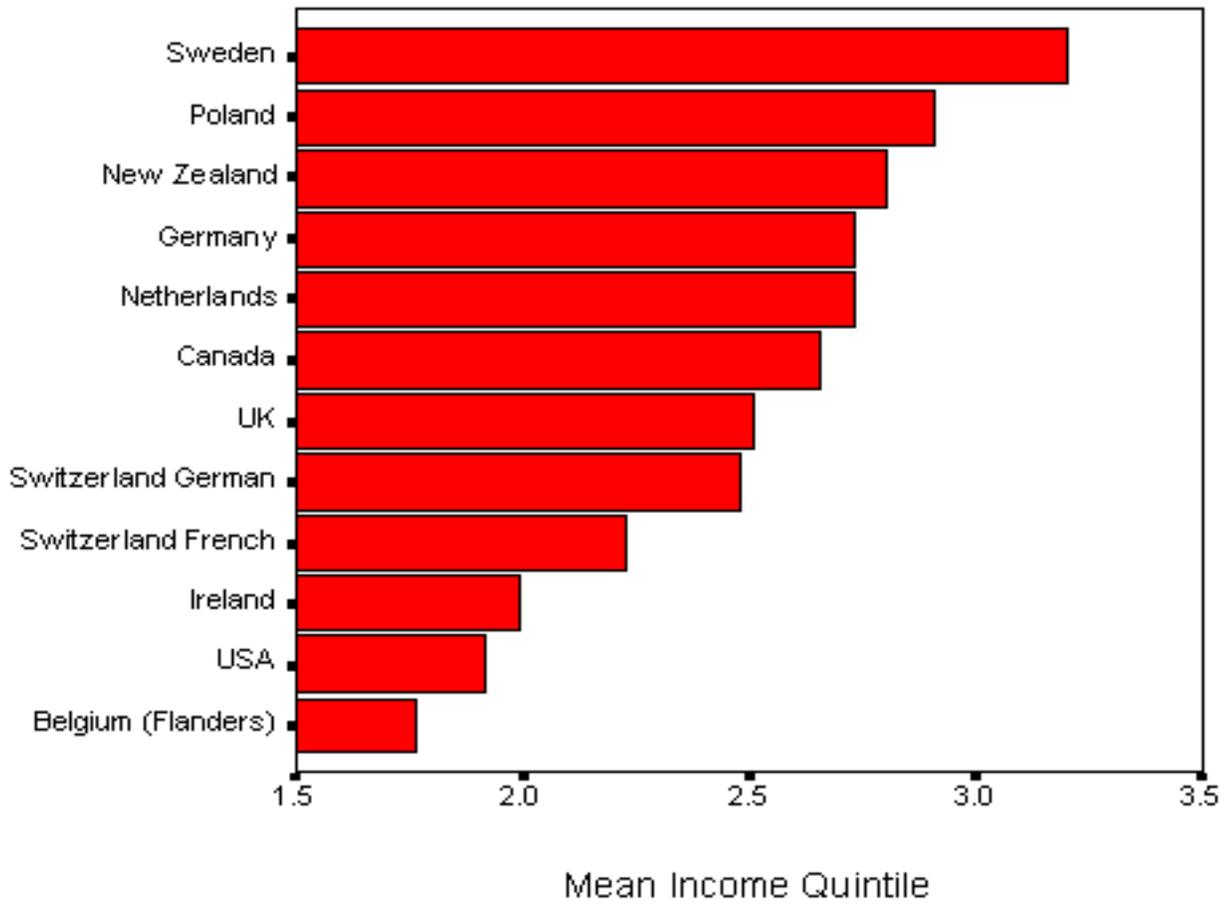


Figure 10. -- Learning disabilities among low-proficiency adults

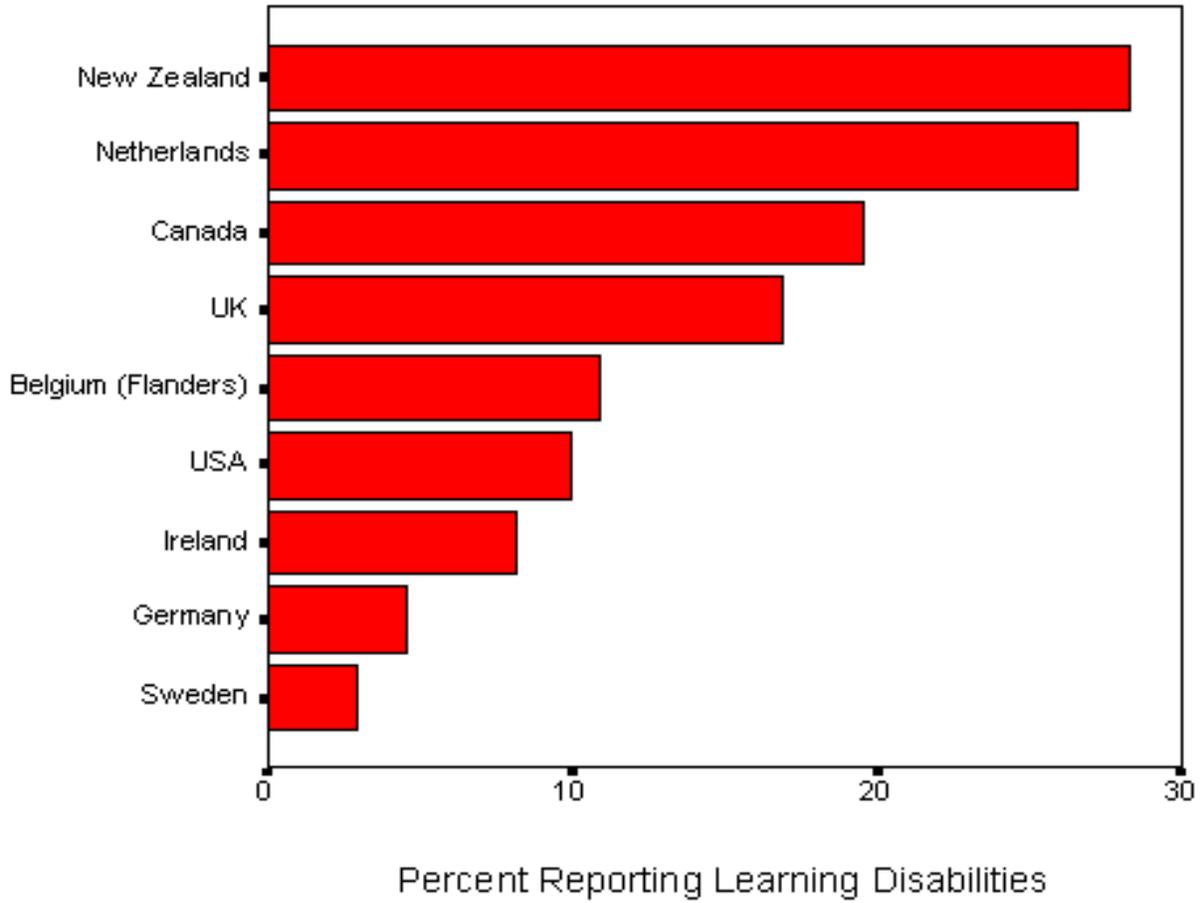


Figure 11. -- High literacy with little formal education

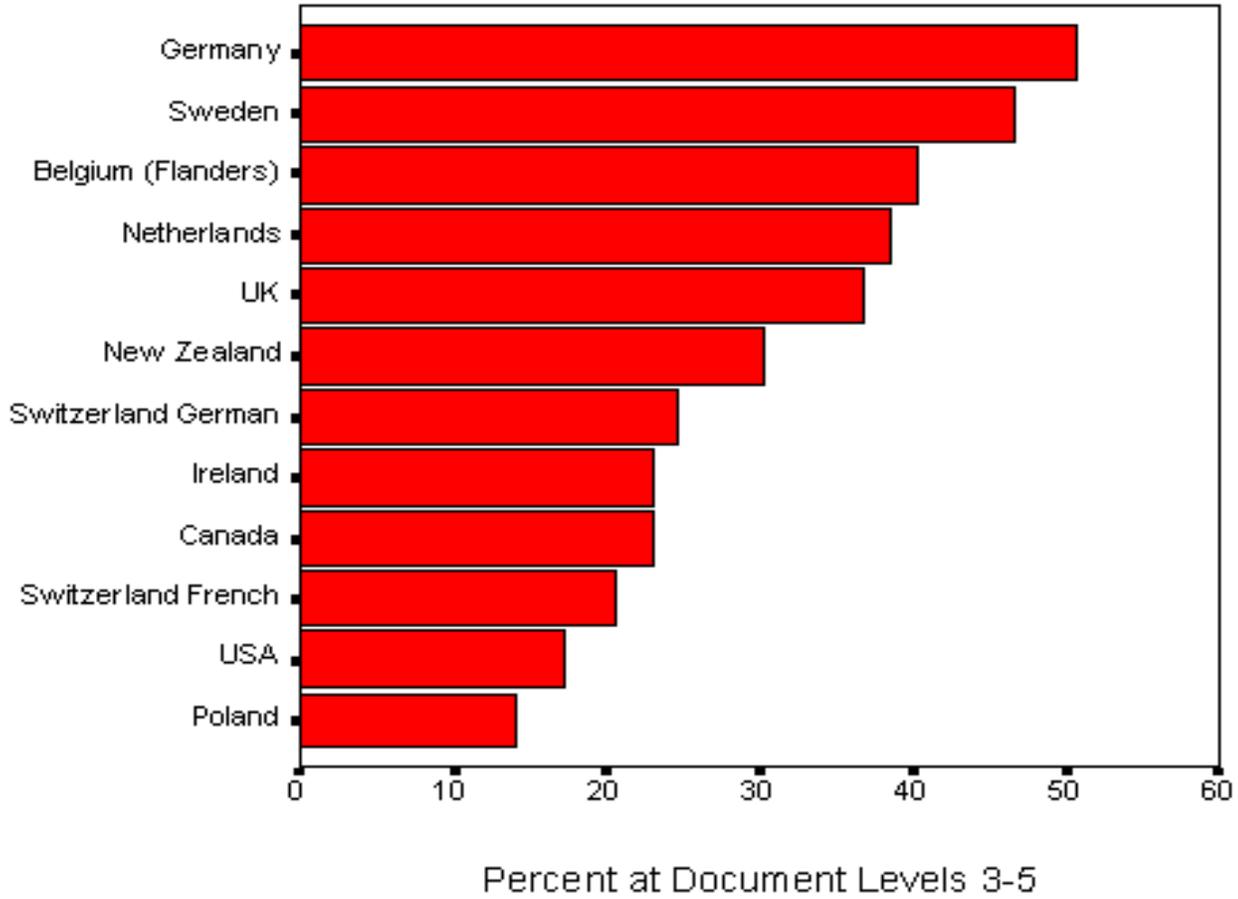


Figure 12. -- Basic skills training and level of literacy skills

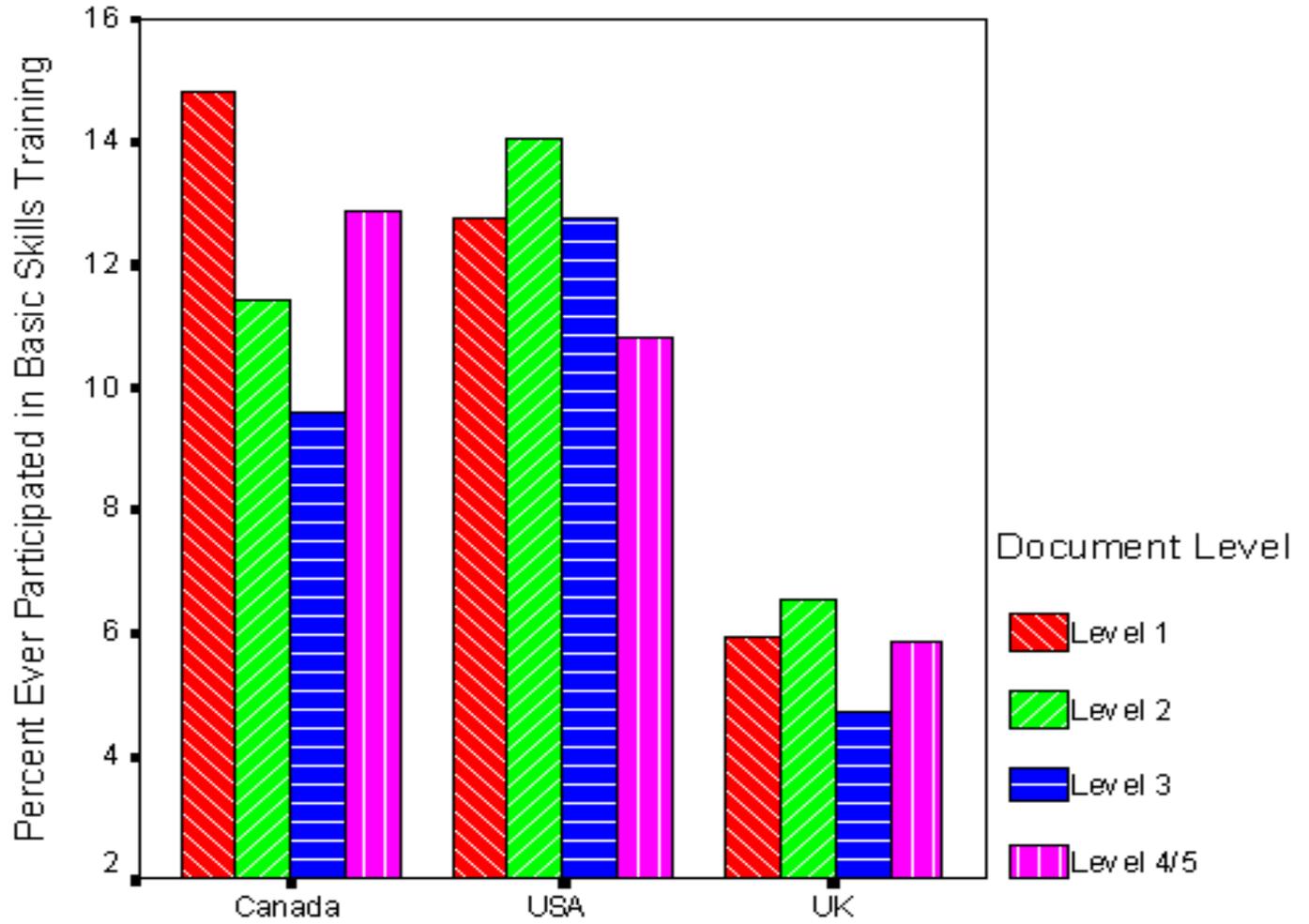


Figure 13. -- Basic skills training and satisfaction with literacy skills

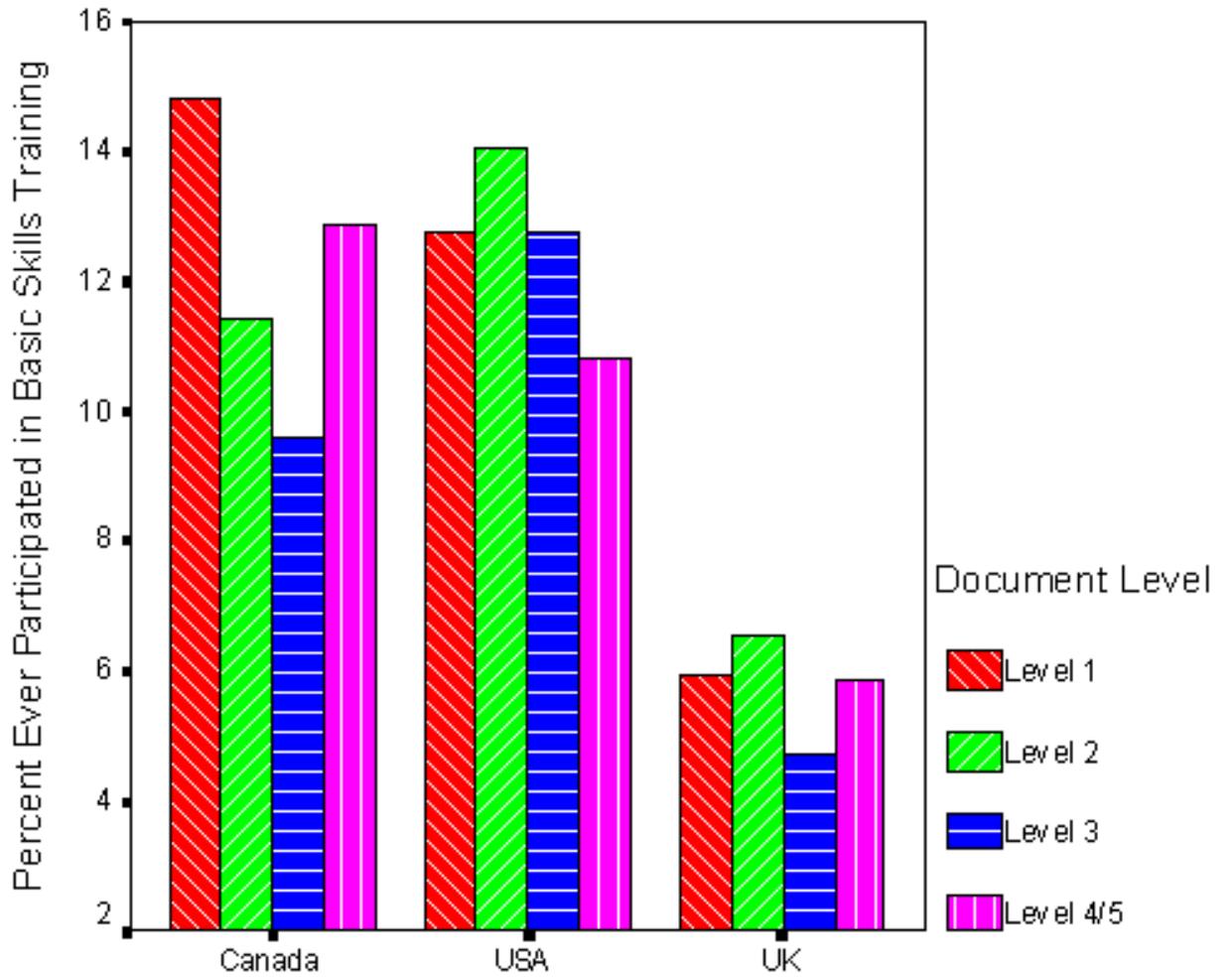


Figure 14. -- Basic skills training and workplace learning

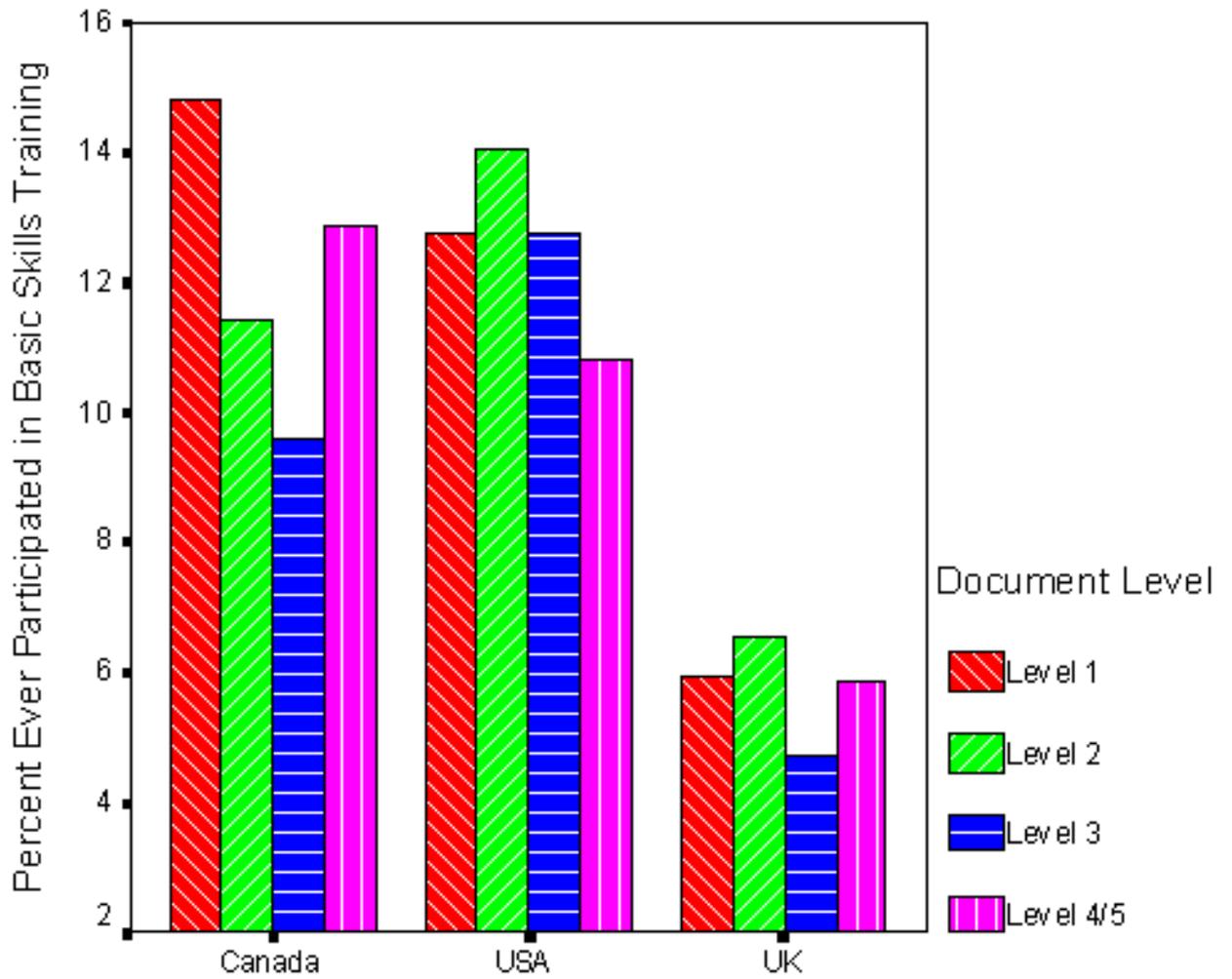


Figure 15. -- Literacy assistance among low-proficiency adults

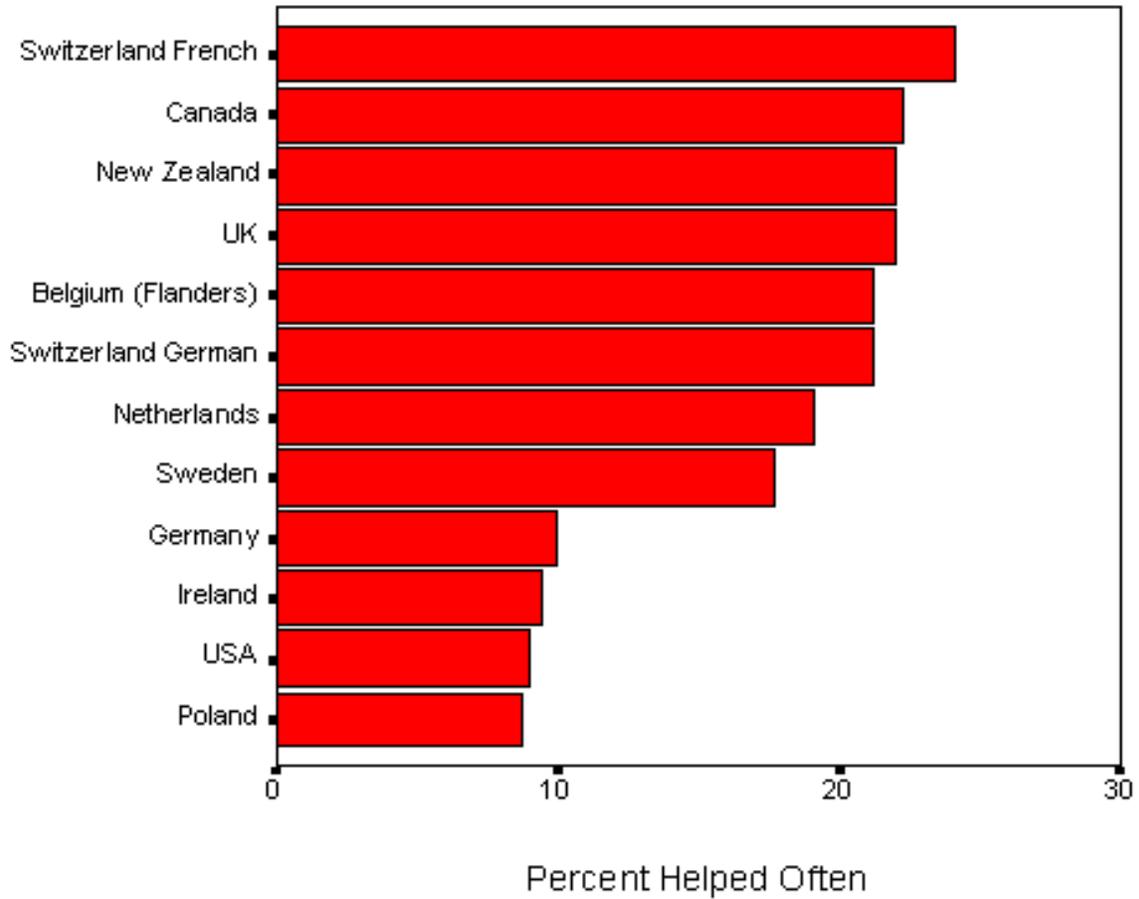


Figure 16. -- Basic skills training and literacy assistance among low-proficiency adults

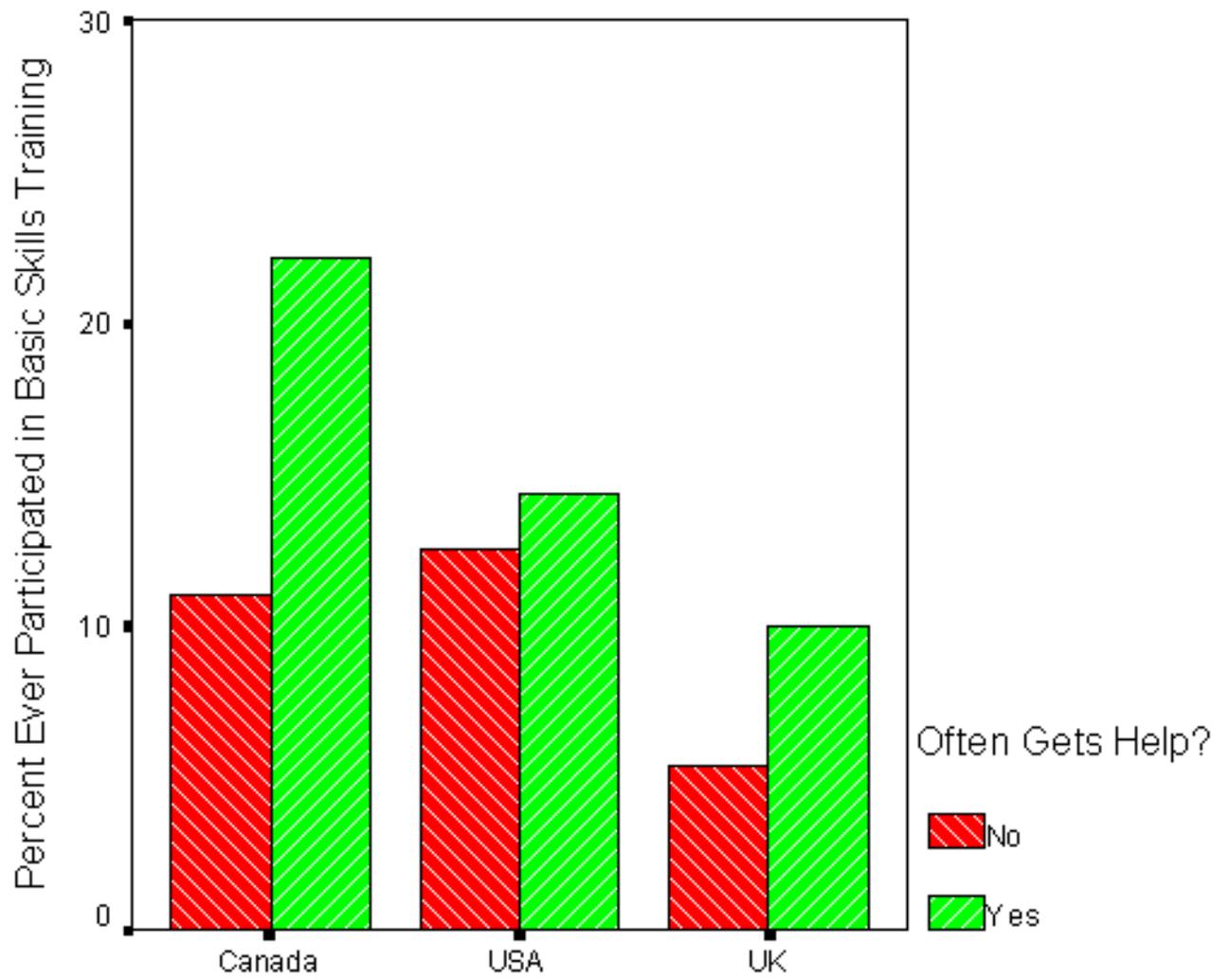


Figure 17. -- Skill acquisition in a workplace

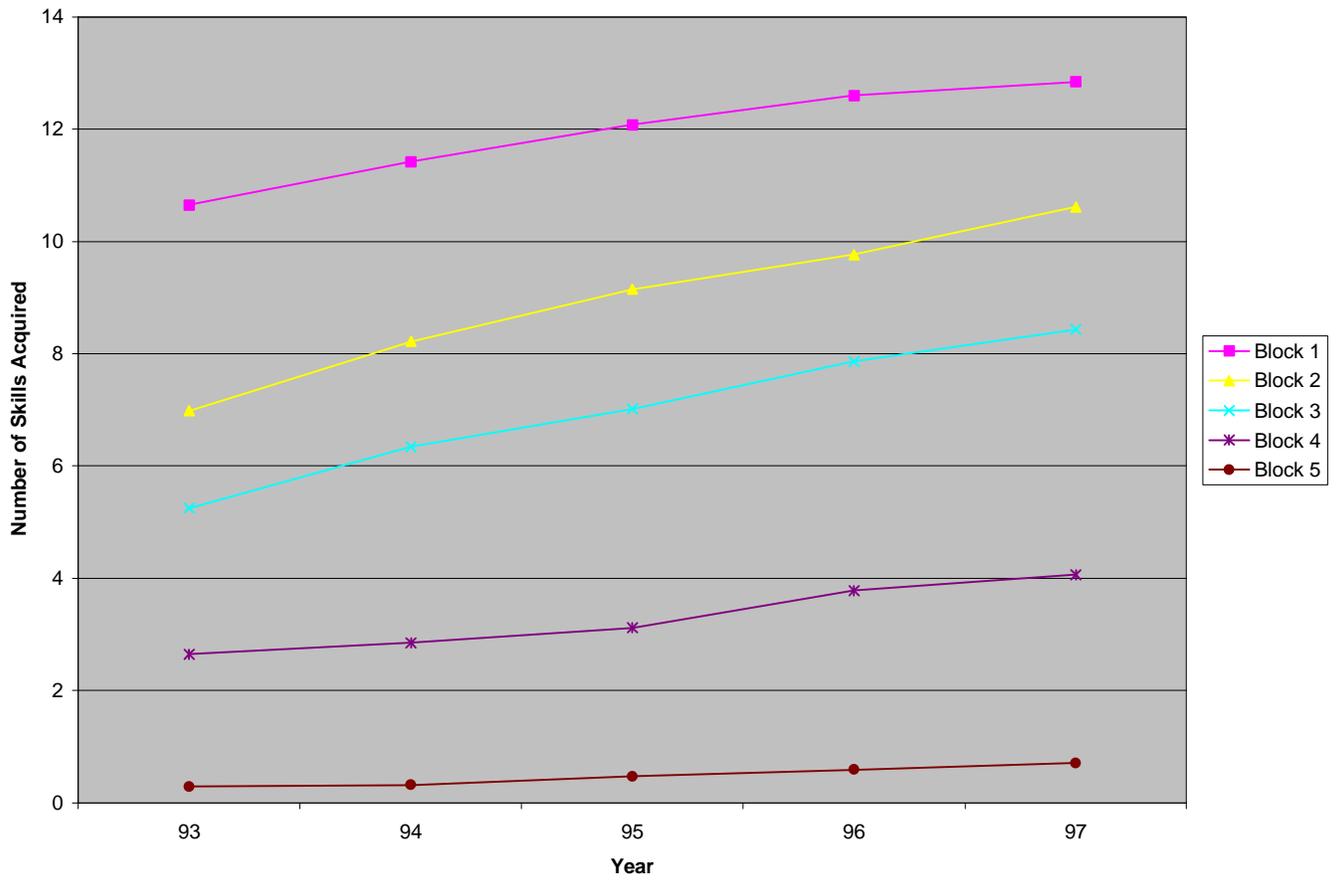


Figure 18. -- Learning and earning in a workplace

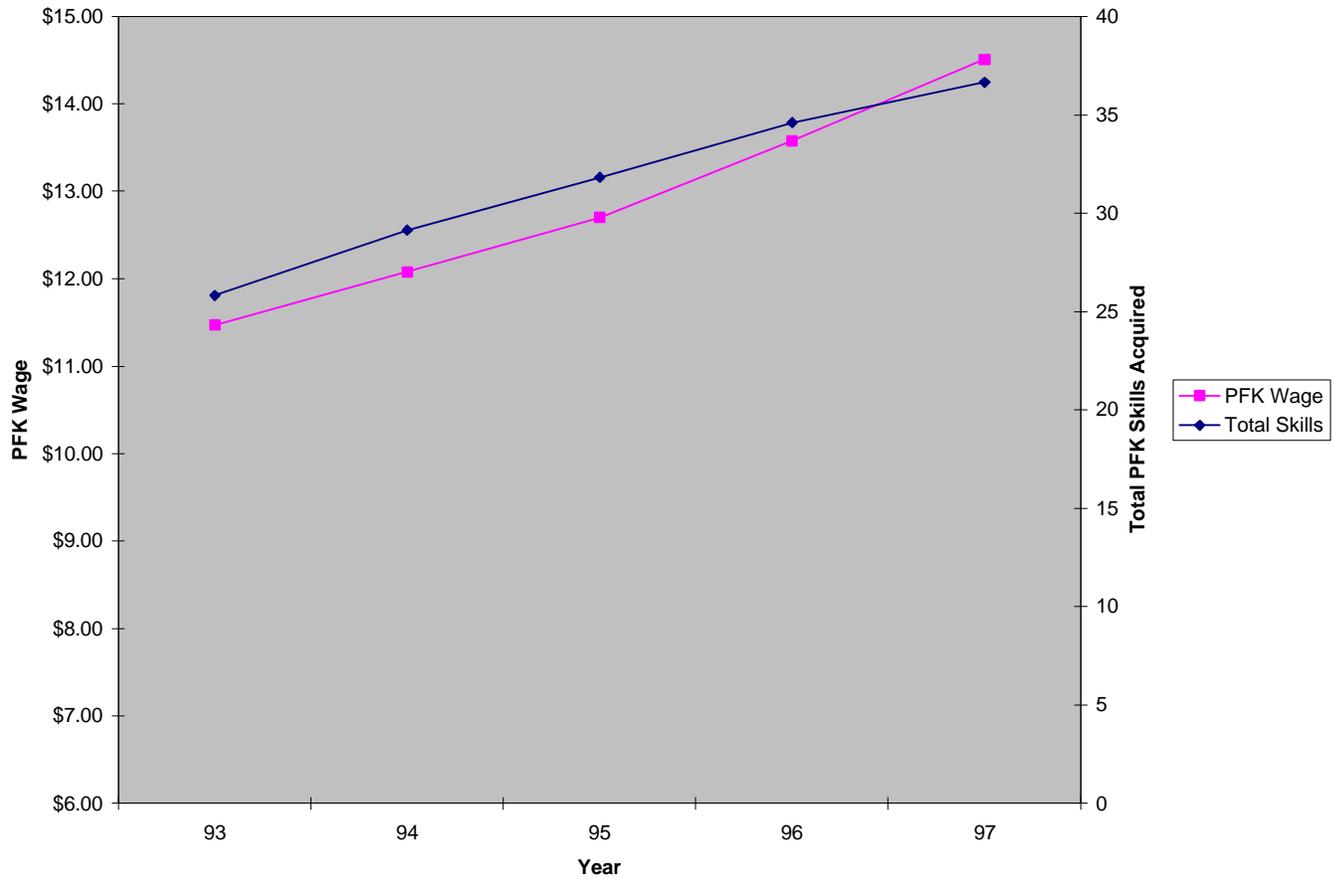


Figure 19. -- Education and learning in a workplace

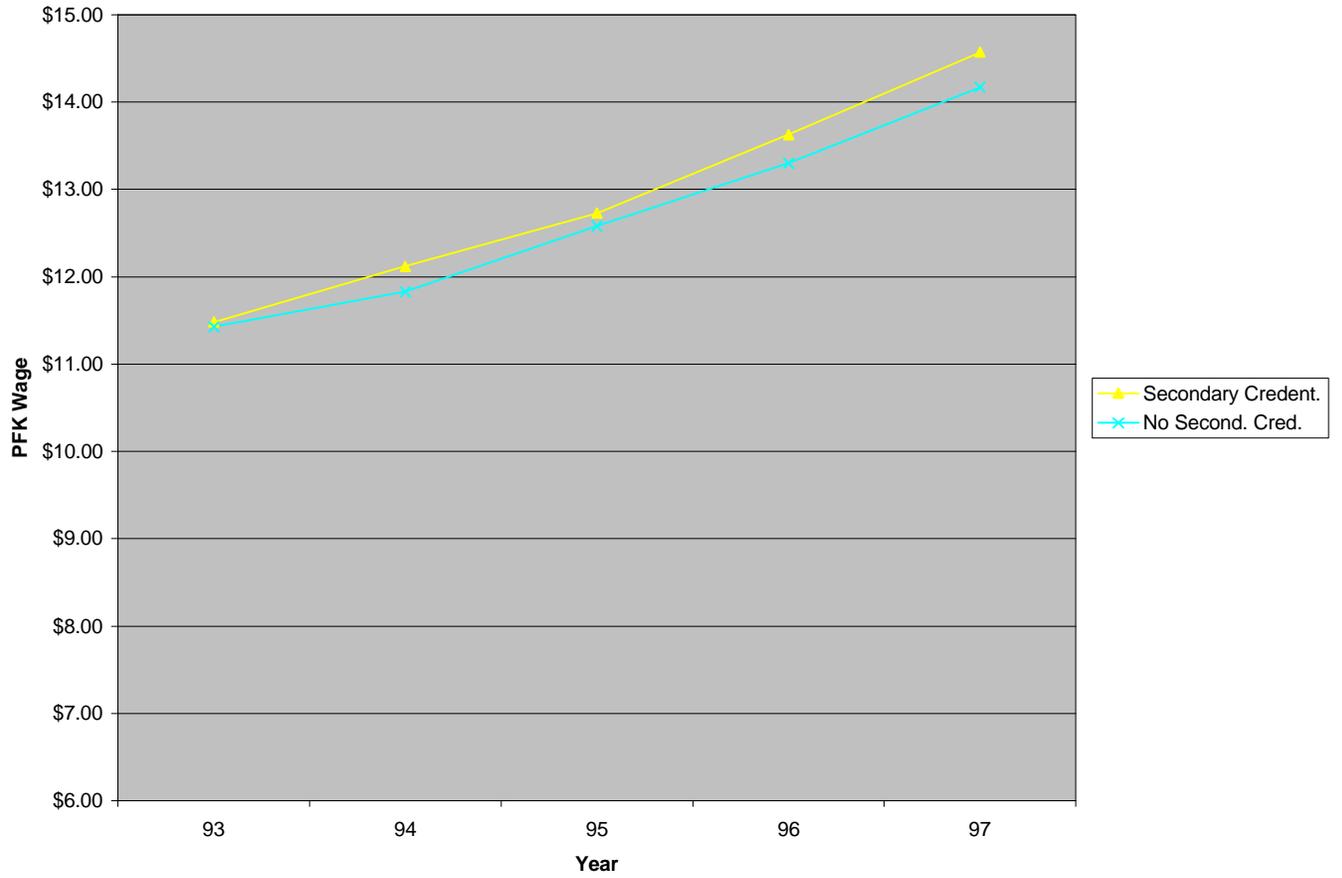
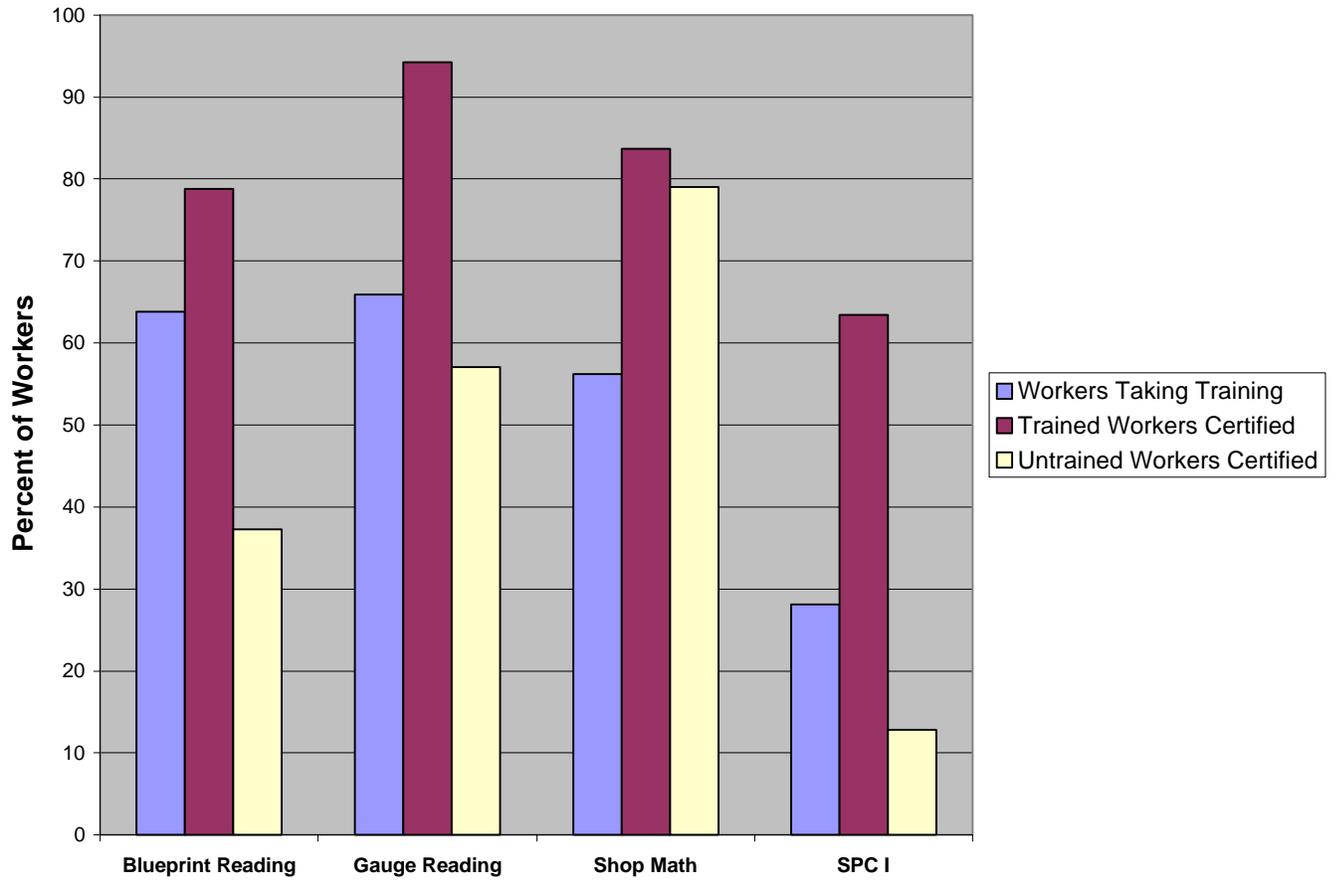


Figure 20. -- Formal and informal learning in a workplace



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