

Determinants of Participation and Nonparticipation in Job-Related Education and Training in Shenzhen, China

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In the fast-growing market-oriented economy of Shenzhen, China, most employees have continued to participate in job-related education and training. We argue that as firms have acquired autonomy in their operations and individuals have gained the right to pursue their personal occupational aspirations, non-state-sponsored education and training systems for the working population have developed to respond to the demands from firms, as well as individuals. With survey data from 3,475 employees in seventy-six firms from Shenzhen, this study uses a multinomial model to examine patterns in employee participation in job-related education and training. There are basically four options open to employees: taking part in education and training provided by a firm to its own employees, enrolling in education and training offered by institutions outside the firm, availing themselves of both options simultaneously, or not participating. Our findings suggest that these four groups of employees vary in terms of their cultural and symbolic attributes, their individual socioeconomic attributes in relation to their workplace, and the economic attributes of their firm.

In a global economy, maintaining organizational and individual competence has become a greater challenge than ever before (Hake, 1999). Education and training (hereafter, ET) is regarded as the primary means by which

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human capital is preserved and increased to ensure workforce competence (Johnston & Packer, 1987, pp. 115–117; OECD, 1992) and the competitiveness of firms and nations, as well as the welfare of social groups, is determined (Thurow, 1996, Reich, 1992). Participation in ET by the working population has therefore assumed great significance. An early study conducted in OECD (Centre for Educational Research and Innovation, OECD) countries found that ET for the adult population has moved from a marginal position in relation to formal educational systems to assume an increasingly important place in a society's overall provision for education (OECD, 1977). In six surveys carried out in the United States, Merriam and Caffarella (1991, p. 81) found that job-related reasons were those most frequently cited for engaging in ET. Cross (1981) also observed that people who do not have good jobs are interested in furthering their education to obtain better jobs, and those who already have good jobs would like to pursue further education in order to prepare themselves for new jobs (Cross, 1981, p. 91). A recent study on new patterns of adult learning in six OECD countries demonstrates that there has been an increase in provision of a great many adult-learning opportunities. Such opportunities have focused on strengthening vocational training to meet the needs of skill development across all occupational strata (Belanger & Tuijnman, 1997, p. 8).

There have been a number of studies about adult participation in ET. Attention has been paid to the motivations for participation (Houle, 1961; Boshier & Collins, 1985), sociological interpretations of participation (Babchuk & Courtney, 1995), and public participation (Darkenwald & Valentine, 1985). As with most studies, the study in OECD countries included a household survey to examine patterns in the participation of the adult population in ET (Belanger & Tuijnman, 1997; Belanger & Valdivielso, 1997). There is also a growing literature indicating that ET has become available to the working population, with the aim of diffusing skills and facilitating the development of human resources (Middleton, Ziderman, & Adams, 1993; Ziderman and Horn, 1995; Xiao & Tsang, 1994; Benson, & Zhu, 2002). Efforts have been made by scholars to study ET in the workplace and its effects on workplace competitiveness (Benson & Zhu, 2002; Smith & Dowling, 2001; Leeuwen & Praag, 2002).

This chapter describes a case study of employee participation and non-participation in ET in job-related contexts in Shenzhen, China. Shenzhen is one of China's Special Economic Zones, established in 1980 to experiment with transforming a planned economy into a socialist market economy. Shenzhen has grown more rapidly than any other part of China. Economic projects have created about 2.3 million new jobs since the early 1980s in all kinds of occupations (Xiao, 1998). In order to prepare the workforce for an economic transition, the Chinese government put forward a policy to promote decentralized ET for the workforce (China Central Committee, 1981; China Education Commission, 1987). A previous study (Xiao & Tsang, 1994)

found that two types of institutions had emerged outside the formal government education system to provide ET programs to employees. The first type is the employee-oriented ET center set up and financed by firms to provide ET to their own employees. There are two main types of training programs: skill development and management training. The firm organizes the training, usually using its own professionals and senior staff but sometimes hiring professionals from other ET institutions. Such ET is job-related, corresponding to the productivity requirements of the workplace, and the employees concerned are required to participate in it. The second type of program is offered by new adult-education institutions in community or university outreach programs. Residents living in the neighborhood are the clients. ET programs include training in practical skills, vocational and technical certificate programs, programs offering credentials, as well as courses on spare-time activities and life skills. Participants voluntarily attend the programs and pay the program fees themselves. Some may receive subsidies from their firms if a program is related to the requirements of their job. In the period 1980–1996, these two systems had provided ET to 80 percent of the 3.5 million residents of Shenzhen.

This study defines job-related ET as referring to “all organized systematic education and training activities in which people take part in order to obtain knowledge and learn new skills for a current or a future job, to increase earnings, improve job and/or career opportunities in current or other fields, and generally to improve opportunities for advancement and promotions” (OECD, 1996, p. 132). Courtney (1989) suggested that the institutional dimension of ET for adults is important because we cannot understand the field without considering the organizations that have helped shape it over the years (Courtney, 1989, pp. 17–18). Lauder (2001, pp. 161–161) also suggests that the issue of the effectiveness of skill diffusion is related to ET systems and the structure of the labor market. This study will analyze what factors are associated with the dependent variable: the participation of employees in ET provided by their firms (or internal ET; hereafter, IET), participation in self-paid ET outside the firm (external ET; hereafter, EET), or participation in both EET and IET (hereafter, BOTH), or none of the above ET options (hereafter, NONE). This study uses data from a survey of 3,475 employees in seventy-six firms, conducted in Shenzhen in 1996 to examine

1. What ET options do employees take up to develop their job competence when alternatives have become available in a market-oriented economy?
2. What cultural and socioeconomic factors are associated with their decisions to participate in ET?

This study contributes to an understanding of the ET systems that have emerged in a rapidly growing economy and the patterns of employee participation and nonparticipation in job-related ET programs.

Theoretical Framework

The sociological perspective maintains that an adult's motivation to participate in ET is related to both the individual's position in the social system and his or her stage in life (Jarvis, 1985, p. 209–210). After reviewing studies of adult participation in ET, Merriam and Caffarella (1991, p. 94) concluded that “if one looks at social structure rather than individual need and interests, one discovers some very different explanations of why adults do or do not participate in adult learning activities.” In comparing the patterns of adult participation in ET in six OECD countries, Doray and Arrowsmith set up a socioeconomic framework with the following four major dimensions (Doray & Arrowsmith, 1997, pp. 43–48): cultural attribution, socioeconomic attributes, economic context, and supply of adult education. The framework helps in understanding both the increase in supply and the rise in demand for ET. First, we will discuss what constitutes the supply of ET and then will examine other cultural and socioeconomic factors associated with participation. This framework takes the perspective of economic sociology (Brown, Green, & Lauder, 2001; Kang, 1999) to understand the increasing supply of ET for employees in the workplace.

Emerging ET Systems and Supply. Brown, Green, and Lauder (2001, pp. 29–34) argued that skill formation and economic performance are socially constructed and experienced within social institutions and can be organized in different ways. China's economic transition serves as an illustration of the creation of new industrial and labor relationships and restructuring in the labor market. China's structure of state power was a unity of three in one, namely, the Party, the government, and production management. The Party, through the government, controlled the organization of production. Directives on labor and quotas on production and supplies were administrated from the top down to the factory floor. Graduates of schools were assigned a life-long job in a particular work unit. Decisions about an employee's ET were entirely a matter between the government and the work unit. Subsequently, however, the market orientation of the economy has pushed the state to give up some powers so that firms can act independently to achieve efficiency (Kang, 1999, pp. 60–82). That firms can be formed in a variety of ownership structures and can control their own daily operations are indicators of a changed social environment. The industrial sectors are detached from the state in terms of administration. Individuals have been freed from life-long job assignments in a work unit. They now have the right to change jobs and make decisions about their personal development. These changes are transforming the state-controlled production units into a firm-controlled internal labor market as well as an external labor market, accessible to both individual employees and firms. In their study of Beijing and Shanghai, Benson and Zhu (2002) found that enterprises buy their labor in the external market. This also means that individuals can realize their occupational aspirations through the external market if they fail to do so in the internal market. Benson and Zhu (2002) also found that

several factors led to the internal development of human resources, including the lack of skilled employees in the external market, the imposition of government-allocated labor for state-owned enterprises, and the inability of firms to pay market rates.

It has been argued that the integration of ET systems with labor markets is structured by the flow of knowledge and skill and by the aspirations and motivations of workers to take up certain occupations (Lauder, 2001, pp. 164–166). Such integration is also shaped by how skill diffusion and personal expertise affect mobility across occupations. We may assume that firms that have gained control over the organization of production in a market economy expect their employees to learn new sets of knowledge, skills, and values to become proficient in major work roles that differ from those in the planned economy. Due to its history and ideology of management, each firm has evolved its own unique organizational culture (Bowman, 1996). Firm-provided ET therefore diffuses specific job-required skills to employees and socializes them to the culture of the enterprise (Hake, 1999, pp. 83–84). This leads employees to orient their aspirations toward the mission of the firm. Workplace development in different firm settings includes the need to learn how to function with peers (Goldstein, 1986, pp. 8–12). Firm-specified IET therefore serves to bind employees into a team and build the competence of the firm.

The breaking of the state-guaranteed “iron bowl” has made employees more independent and has opened up their occupational horizons. But “individuals increasingly have to assume personal responsibility for formulating their identities and life courses” (Hake, 1999, pp. 85–87). Individual employees hunt for new jobs when they believe that their potential could be better realized in other job settings. But they can also be dismissed if their job performance is not up to the expected requirements. Studies in other parts of China have found that improving job-related skills is ranked as more important than other reasons for taking adult education courses (Jones & Wallis, 1992; Zhu, Huo, & Zhao, 1997). Therefore, both occupational aspirations and awareness of the discrepancy between their skills and aspirations motivates employees to seek ET.

In their study of human resource strategies, Benson and Zhu (2002) noted that firms in Beijing and Shanghai make use of both internal and external labor markets. When the external market cannot meet their human resource needs, they use an internal strategy to produce the required human resources through IET. Therefore, this study assumes that non-state-sponsored ET systems have been constructed in Shenzhen with the flexibility to fulfill the demand from the internal market of firms as well as the occupational aspirations of individuals. It also assumes that employees who find that their occupational aspirations and expertise match their firm's expectations are more likely to receive IET. Those who find that IET does not meet their needs for skill development and their occupational

aspirations are more like seek training outside the firm (EET). More energetic and ambitious employees who have broad and diverse prospects for career development will take part in both IET and EET (BOTH).

This study is also concerned about nonparticipation. Exclusion from ET has been an issue for most disadvantaged populations (Rubenson & Xu, 1997; Merriam & Caffarella, 1991, pp. 86–91; Lauder, 2001, p. 166). In OECD countries, institutional, situational, and dispositional barriers continue to be the major deterrents to adult participation in ET for reasons associated with the cultural and socioeconomic structures of society (Quigley & Arrowsmith, 1997, pp. 101–123).

Factors Associated with Employee Participation. Participation in ET relates to the maintenance of the social system, the transmission of knowledge, individual advancement, and individual or social development (Jarvis, 1985, pp. 133–150). In a study examining the social, economic, and political context of adult participation in undergraduate programs in the United States, Jung and Cervero (2002, pp. 309–312) specified sociodemographic, economic, educational, and political factors as predictor variables. Each factor refers to certain components of structural characteristics that have evolved socially and historically. In Cookson's framework (1986) of participation in adult education, external context, an individual's social and cultural background, and situational contexts are stated as critical variables to predict participation. Doray and Arrowsmith (1997) delineated a socioeconomic theoretical framework to study adult participation in six OCED countries. In their framework, individual cultural attributes and economic context are major predictors (1997, pp. 43–48). This study likewise adopts these commonly observed predictors as independent variables.

Cultural and Symbolic Attributes. Cultural and symbolic attributes refer to social characteristics of individuals, including age, gender, initial education and cultural capital, ascribed social positions, experience and history of activities, and resources and access to resources (Cookson, 1986, pp. 133–134). The argument is that variables such as age, gender, experience, and initial education lay the basis for personality and culture and, consequently, a person's relationship with the institutions of society (Cookson, 1986, pp. 133–134; Doray & Arrowsmith, 1997, pp. 43–44). For example, in terms of motivation and ability, initial education may have a far-reaching influence on how people perceive work experience and envision the future. Initial educational attainment is the social background or social role variable consistently observed as the most powerful predictor of adult participation in ET (Cookson, 1986, p. 134; Jung & Cervero, 2002). Studies continue to report that individuals with lower levels of educational attainment are much less likely to participate in ET, whereas experience in postsecondary education is associated with higher participation rates (Doray & Arrowsmith, 1997, p. 59). In this interpretation, differences in socialization account for much of the gender difference in educational pathways.

It is also argued that age is arbitrarily used as an indicator of certain era because each generation in its life passage carries cultural or social marks of their times (Doray & Arrowsmith, 1997, pp. 43–45; Cookson, 1986, p. 134). Variables such as gender, age, experience, and initial education are of great interest because comparative studies in OECD countries (Belanger & Valdivielso, 1997) show that they affect participation in ET.

HYPOTHESIS 1. Those who have more schooling, those with experience in other firms, those who are male, and those who are younger are more likely to participate in EET, IET, or BOTH.

Individual Socioeconomic Attributes. The continuous renewal of skills is important both for individuals to keep abreast of change in the workplace and for firms to diffuse skills among employees. Differences in access to ET opportunities between primary and secondary labor markets have been noted, reflecting segmentation (Benson & Zhu, 2002; Doray & Arrowsmith, 1997). It is also evident that firms with a complex internal structure are more likely to provide IET for their workforce. Since these structures vary in both internal and external markets, the ET opportunities or training resources available to different categories of employees will vary.

Individual employees hold different positions in the enterprises and consequently have different work experiences; thus, their opportunities for ET will vary. Cookson (1986, p. 135) referred to this as the “resource opportunity structure.” Changes in the workplace, occupation, and internal mobility may all play a part in variations in participation in ET (Doray & Arrowsmith 1997, Table 3.2, p. 48).

Occupational differences reflect actual cultural attributes (Doray & Arrowsmith, 1997, p. 44) and hierarchical status in a social institution. Empirical studies (Belanger & Valdivielso, 1997) in the United States (p. 101), Sweden (p. 85), Poland (p. 61), and Switzerland (p. 119) show that those at higher levels of the occupational hierarchy, particularly managerial staff, professionals, and technicians, are more likely to participation in ET programs for adults. The concern is that job-related ET allows those who already have a good stock of skills to continue to develop their competence, thereby maintaining and furthering their advantage in the labor market (OECD, 1996, pp. 131–132).

HYPOTHESIS 2a. Those who are at the upper levels of the occupational hierarchy are more likely to take part in IET and BOTH, whereas those who are at the lower levels of the occupational hierarchy, such as nonskilled workers, are less likely to participate.

Changes in the workplace have been a constant in Shenzhen. The massive introduction of technology from Hong Kong and other countries continues

as part of a strategy to increase capital and catch up with international markets (Li, 1995). Firms under competitive pressure make changes to and improve products and services and reorganize production. Some scholars (Hake, 1999, pp. 80–81; Winterton & Winterton, 1997) have argued that the removal of traditional practices and the application of new knowledge mean that employees need to acquire new skills to develop their competence. Such massive changes lead to discrepancies between the current and the desired levels of proficiency (Knox, 1980, p. 378), which highlight a gap in skills of the workforce, thus leading to a need for workplace training.

HYPOTHESIS 2b. The greater the extent to which an employee experiences changes in the workplace, the more likely he or she will be to participate in IET, EET, or BOTH.

In Shenzhen, computer-aided manufacturing has replaced traditional individual-piece work. Firms have flattened the hierarchical structure to reduce costs. Employees are evaluated on their proficiency and assigned to more appropriate jobs in the firm. Smith and Dowling (2001) also found that the level of technology is related to the extent to which the workplace is reorganized, thus creating the need for training. In Shanghai, Lai and Lo (2001) found that under the pressure of market forces, internal mobility and vocational displacement are intensified. This pushes employees to learn and adjust to changes in the workplace.

HYPOTHESIS 2c. Internal mobility is associated with participation in IET, EET, or BOTH. An employee who is upwardly mobile is more likely to participate in IET, whereas an employee who has experienced downward mobility is more likely to take part in EET.

The Economic Context and Strategy of Firms. Economic context has a direct impact on firms, which in turn put pressure on employees to upgrade their skills. The current evidence indicates that firms that compete in high-technology sectors and adopt new business strategies invest substantially more in ET than firms in other sectors of the labor market (Doray & Arrowsmith, 1997, p. 45; Smith & Dowling, 2001; Benson & Zhu, 2002). In this respect, employers regard ET as elements of their human resource strategies.

In the 1980s, Shenzhen began its economic development with manufacturing and assembly industries to accumulate capital. The 1990s then saw tertiary industries such as banking, finance, insurance, and business consultation growing as a spearhead to maintain growth (see Liu, 1992). Studies by Benson and Zhu of Chinese firms (2002) and Smith and Dowling of seven Australian firms (2001, pp. 152–155), both found that firms' need to cope with an increasingly competitive environment has required development of

different business strategies, which has resulted in increased expenditure on training.

HYPOTHESIS 3a. Employees in the service sector, which has become the spearhead of economic strategy in 1990s, are more likely to take up IET, EET, or BOTH.

Firm size is a factor and strategy of competing that has an impact on the capacity of firms to provide training (Lauder, 2001, p. 162; Cappelli & Rogovsky, 1994). In industrialized countries, larger firms generally provide more training to employees than smaller firms (OECD, 1991, ch. 5). In some developing countries such as Indonesia and Hong Kong, smaller firms have also been found to have a lower propensity to provide formal training to employees than larger firms (Middleton et al., 1993, ch. 6). In Taiwan, the large monopolistic utility companies were found to provide more training to employees than smaller construction companies (San, 1990). However, in the United States, Bishop (1982) found that the smallest firms (those with fewer than ten employees) did not provide the least amount of training per employee.

HYPOTHESIS 3b. Employees in large firms are more likely to take part in IET or BOTH. Employees in medium and small firms may participate in EET.

Non-state-owned business entities are growing in number in China's market economy as foreign capital enters the market to seek investment opportunities. In studying cross-cultural influences on human resource development in East and Southeast Asian countries among indigenous firms and those affiliated with multinational firms, Bartlett and associates (Bartlett, et al., 2002) found a significant relationship between the degree of HRD activity in firms affiliated with multinational firms and in indigenous firms. Both U.S. firms and Japanese firms are more likely to pursue an HRD policy in host countries, and this seems to act as a lead for indigenous firms. In Beijing and Shanghai, the competitive market that has emerged for skilled labor has led the state-owned enterprises (SOEs) and non-state enterprises to adapt to different human resource strategies (Benson and Zhu, 2002, p. 461).

HYPOTHESIS 3c. Employees in firms with investment from outside mainland China are more likely to participate in EET, IET, or BOTH.

Methods

This study employs the reverse tracer study technique (RTST) to survey individual employees in seventy-six firms in Shenzhen. RTST focuses on the analysis of persons who are currently employed in particular occupations and traces

their ET histories. It begins with the individual's current job and seeks to identify each major route in alternative ET that the individual pursued to attain his or her current job. As pointed out by Ziderman and Horn (1995), RTST is most suited to addressing questions such as, *Where do skilled workers obtain their training?* Our studies (Xiao & Tsang, 1994) have indicated that many employers and employees have used job-related ET to develop their job skills. Based on our records of firms, interviews with educators and ET managers, observations, and findings from previous studies, we developed the present reverse tracer study questionnaire to uncover the extent to which individuals participate in job-related ET.

The Instrument. The survey questionnaire consisted of four major groups of questions to track: (1) initial education, (2) participation in job-related ET provided internally by firms (IET), (3) participation in self-paid, job-related ET provided by other institutions outside the firm (EET), (4) job characteristics such as occupation, mobility within the firm, and changes in the workplace. The survey was conducted at the end of 1996. The surveyed employees were asked to recall their participation in ET during a five-year period from 1991 to 1996. A separate questionnaire was distributed to each firm to collect data on the characteristics of the firm, including firm size, ownership, sector, and so forth.

Sample and Data Collection. The population of this study consists of employees in all the economic entities that registered with Shenzhen Government for economic activities. Stratified random sampling was used to select the participating firms and employees. The stratified sample included (1) firms in both service and manufacturing sectors, (2) firms of different types of ownership, (3) firms of different sizes, and (4) one or two major production lines in the firms, including all personnel, from managers, clerks, and technicians to machine operators. For both the manufacturing and service sectors, three large firms (defined as those with more than 800 employees), two medium-sized firms (with between 301 to 800 employees), and one small firm (fewer than 300 employees) of each of the eight types of ownership were to be sampled, for a total of ninety-six firms. The production-line sampling strategy included the actual personnel structure in the firm.

In selecting the firms, the *Shenzhen Yearbook of Registered Firms 1996*, which contained information on these classifications, was obtained from the Association for Shenzhen Enterprises (1996). Representatives of industrial and service firms were randomly selected. Managing directors were contacted by telephone. The ownership and size of their firms was confirmed and their consent was obtained for their firm to participate in the study. When either of the above conditions was not met, another randomly selected firm was approached. After deleting some types that did not exist (large, private, service firms, for instance), seventy-six firms, which agreed to participate in the study with one or two of their production lines or groups, were finally selected. A total of 6,200 employees in these firms were surveyed, slightly less than

1 percent of the registered workforce in Shenzhen. Of the seventy-six firms, forty-two are in manufacturing and thirty-four are in the service sectors.¹

In conducting the survey, questionnaires were sent by our research staff to one main production line or work group (if it contained fifty employees or so) or two (if there were fewer than twenty-five employees in each) in a firm. Questionnaires were then distributed to each employee on the production line. The same research staff then went to collect the completed questionnaires in the morning a couple of days after they were distributed. Of 6,200 surveyed employees, 4,002 returned the questionnaires, for a response rate of 65 percent. Those who did not return the questionnaires were mostly those who had failed to bring the questionnaire to the firm on the day it was to be collected. Among the returned questionnaires, state-owned firms were underrepresented whereas corporate firms were oversampled because their production lines or work groups were large. Weights were then applied to the sample to arrive at a representative sample of the overall workforce.

There are cases of missing variables. We compared the distributions of the missing cases with that of the nonmissing cases. We found that their distributions were very similar. Then we deleted the missing cases. The data set for the analysis consisted of 3,475 cases, 86 percent of the sample (Table 1).

Dependent Variable. The independent variable *ET*, job-related education and training, refers to an employee's actual participation or nonparticipation in different options of *ET*.² This study focuses on employees' participation as differentiated by source of provision, whether by their firms or by institutions outside their firm. Participation in self-paid *ET* outside the firm is coded as 1 for *EET*, participation in internally provided *ET* is coded as 2 for *IET*, participation in both *EET* and *IET* is coded as 3 for *BOTH*, and participation in none of them is coded as 4 for *NONE*. Since the dependent variable contains more than two options, a multinomial logistic model is used to conduct the analysis, and *NONE* is used as a reference group for comparison.

Table 1 contains sample distributions for each variable (see column 2). Columns 3 to 6 also show distributions of employees of the same group taking each of the four options for participation during the five-year period of 1991–1996. A Pearson Chi-square Test of independence was run with cross-tabulations for each independent variable with the dependent variable. Except for *EXPERIENCE*, the Chi-square of all of the tests was at a significant level ($p < .001$), and it is assumed that the count of each independent variable at the different combinations with independent variable are independent, with a fixed total number of occurrences of participation.

The distribution of the dependent variables shows that firms have assumed a major responsibility for providing job-related *ET* to employees, with those taking part in *IET* making up about 42 percent of the sample and those taking part in *BOTH* consisting of about 25 percent of the sample. Those in the latter group were also taking part in self-paid *EET* outside their firm. The former group should have a salient pattern corresponding to the economic

Table 1. Descriptive Statistics (Total N = 3,474)

Independent Variable and Definition	Code	1		2	3	4	5	6
		Frequency		%	Dependent Variable			
					EET (%)	IET (%)	BOTH (%)	NONE (%)
		3475			6.7	41.5	25.1	26.7
SEX								
Female	0	1766	50.8		7.9	40.4	26.9	24.8
Male	1	1708	49.2		5.5	42.5	23.3	28.7
AGE								
Age 16–25	1	1647	47.4		6.3	40.9	26.4	26.5
Age 26–35	2	1342	38.6		7.2	41.4	26.8	24.7
Age 36 and above	3	485	14.0		6.8	43.7	16.5	33.0
EXPERIENCE: Whether one had work experience								
No	0	2267	65.3		6.4	41.1	26.5	26.1
Yes	1	1207	34.7		7.4	42.1	22.6	27.9
SCHOOLING: Initial educational attainment								
Lower secondary general ed.	1	643	18.5		4.7	42.5	18.2	34.7
Upper secondary general ed.	2	1254	36.1		6.9	42.7	29.2	21.1
Secondary vocational ed.	3	761	21.9		8.0	37.1	30.6	24.3
Junior college	4	310	8.9		8.7	32.6	30.3	28.4
4-year univ. and above	5	506	14.6		5.5	49.0	12.5	33.0
OCCUPATION								
Managerial staff	1	338	9.7		5.6	43.5	31.4	19.5
Professional staff	2	695	20.0		6.6	41.9	24.6	26.9
Clerks and office staff	3	171	4.9		7.6	37.4	27.5	27.5
Salespersons	4	519	14.9		12.9	29.9	34.7	22.5
Nonskilled workers	5	940	27.1		4.8	39.0	23.7	32.5
Nonskilled support staff	6	309	8.9		5.0	46.3	18.7	30.0
Floor skilled workers	7	502	14.5		5.5	49.2	23.9	21.4
W_CHANGE: Change in workplace								
No change	1	588	16.4		7.5	41.5	16.8	34.2
Not sure about it	2	532	14.8		8.6	19.0	7.9	64.5
3 to 4 times	3	1486	41.3		6.3	43.1	33.9	16.7
More than 5 times	4	250	7.0		0.0	76.0	23.2	0.8
1 to 2 times	5	740	20.6		7.6	42.0	26.4	24.1
MOBILITY: Whether one has internal mobility								
Downward mobility	1	592	17.0		7.8	38.9	24.7	28.7
Upward mobility	2	1167	33.6		6.5	42.3	30.2	21.0
No mobility	3	1715	49.4		6.5	41.7	21.9	29.9
SECTOR: Economic sector								
Manufacturing	0	2139	61.6		6.0	40.1	25.3	28.6
Service	1	1335	38.4		7.8	43.6	24.9	23.7

Table 1. (Continued)

Independent Variable and Definition	Code	1 Frequency	2 %	3	4	5	6
				Dependent Variable			
				EET (%)	IET (%)	BOTH (%)	NONE (%)
SIZE: Firm size (# of employees)							
Small (300 or fewer)	1	706	20.3	6.1	37.8	18.4	37.7
Medium (301 to 800)	2	926	26.7	7.9	45.4	24.0	22.8
Large (over 801)	3	1842	53.0	6.4	40.9	28.3	24.5
OWNERSHIP							
Corporate	1	821	23.6	7.7	37.8	27.9	26.7
Private/collective	2	407	11.7	5.9	33.9	12.0	48.2
Outside	3	1362	39.2	5.2	45.6	25.7	23.5
State-owned	4	884	25.4	8.5	42.0	27.7	21.8

attributes of their workplace. The latter group, considering their willingness to set aside both time and money for additional *EET*, is the most vigorous in the labor markets. About 7 percent of the sample were participating in *EET* only. This group of employees should have a pattern that corresponds to their personal occupational aspirations but less likely to correspond to workplace attributes. Still, about 27 percent of the sample were nonparticipants.

Independent Variables. The first group of variables are variables for cultural and symbolic attributes. They include *SEX*, *AGE*, *SCHOOLING*, and *EXPERIENCE*. For *SEX*, females are coded 0 and males 1. Males are used as the reference group for comparison.³ *AGE* is coded into age-groups. Shenzhen is a newly industrialized Special Economic Zone. The workforce is fairly young. Thus, not surprisingly, those aged sixteen to twenty-five and twenty-six to thirty-five make up 85 percent of the sampled employees. Those aged thirty-six and above are coded as 3 and used as a reference for comparison.

SCHOOLING is the initial formal education that one received before one's first job. It is classified and coded into five categories by type and level of educational attainment. The first is *LSE*, attainment of nine years of schooling up to lower secondary education. The second is *USE*, attainment of twelve years of schooling up to upper secondary education. The third type is *UVTE*, usually attainment of nine years of general education plus three years of vocational/technical education at the upper secondary level. The fourth is *JCE*, attainment of a total of about fourteen years of education up to the junior college level. The last group is *UNE*, attainment of a four-year university degree or higher degrees.

EXPERIENCE refers to whether one had worked elsewhere before taking up a position in the current firm. If one had work experience before coming to the current firm, this is coded as 1, otherwise as 0.

The second group of variables comprises individual socioeconomic attributes related to the workplace. These attributes reflect the social and economic status of employees in the workplace. *OCCUPATION* reflects one's social status in the hierarchy of the workplace, as well as one's expertise as recognized by the firm. There are seven categories of occupation and they are in accordance with those listed in the payroll. Managerial staff includes business administration officers and managerial staff. Professional refers to those engaged in research, design, and development and lawyers, high-ranking accountants, engineers, and senior technicians. Salesperson is a new position. Instead of turning all of their products over to the state as they did under the planned economy, firms have to rely on salespeople to sell their products in competitive markets. Clerks and office staff are those who carry out daily office administrative routines. Skilled workers refer to those who have obtained proficiency in intermediate skills. Nonskilled workers are unskilled or semiskilled employees who carry out primary tasks. They usually work on tasks of assembly in the production line or follow routines in the office. Nonskilled support staff includes building custodians, warehouse keepers, and security personnel.

W_CHANGE refers to technological and organizational changes that an employee reported as having experienced during the period 1991–1996. Changes in the workplace occurred due to (1) the adoption of new technology, (2) the production of a new product or provision of a new service, and (3) the assignment of new tasks or new job requirements due to the reorganizing of production. These changes occurred because firms made efforts to remain competitive. During the collecting of data, employees were also asked to recall how many times that they had experienced each of these major changes. The initial analysis showed that the intensity of the changes, rather than their type, is correlated to participation in ET. Thus, *W_CHANGE* is coded as intensity in terms of the number of times an employee had experienced major changes. Having experienced no change is coded as 1, not being sure about change is coded as 2, having experienced changes three to four times is coded as 3, and having experienced changes five or more times is coded as 4. Having experienced change one to two times is coded as 5.

MOBILITY refers to internal mobility, either to changes in occupation or to promotions and demotions during the period 1991–1996. During this period, firms in Shenzhen carried out reforms in personnel management and constantly reorganized production to cope with external competition. Therefore, employees were often given new assignments. In the questionnaire, employees were asked to recall their occupation and position and rank in 1991 and then in 1996. Those who were given a promotion or a new position that was above their position in the occupational hierarchy of 1991 are coded as being upwardly mobile. Those who were transferred to a lower position in the occupational hierarchy are coded as being downwardly mobile. Those who remained in the same position are coded as being not mobile, and are used the reference group.

SECTOR refers to the economic sector to which the employee's firm belongs, either the manufacturing sector, coded as 0, or the service sector, coded as 1. *SIZE* contains three groups of firm size; namely, small, medium, and large. They are coded as 1, 2, and 3, respectively.

OWNERSHIP refers to types of investment owners. In this study, the following eight types of ownership were first found: state-owned; collectively owned; joint-ventures with firms from Hong Kong and Taiwan; joint-ventures with firms from other countries; sole-investment firms from Hong Kong, Macau, and Taiwan; sole-investment firms from other countries; local private firms; and corporate firms. The first two types are considered typical of the planned economy, and the six latter ones are new forms of ownership in the economy that took shape after 1980. In the analysis, the firms are grouped into four types according to their economic attributes. The first type consists of corporate firms, which are mostly newly formed firms, many of them transformed from state-owned firms. The second consists of firms that are collective and local private firms. They are mostly small in size and occupy a marginal position in the competitive economy. The third are the four types of firms with capital investment from outside mainland China. The fourth type is the state-owned firm, which is used as the reference group for comparison.

Results

Our core concerns are

- Of what ET option do employees avail themselves to develop their job competence when alternatives in the provision of ET have become available in a market-oriented economy?
- What cultural and socioeconomic factors are associated with the decision of employees to participate in ET?

Since the dependent variable contains four categories of choices, it is appropriate to use multinomial logistic regression to examine the relationship between independent variables and the choice of employees in participating in ET.

To test the hypotheses on three groups of independent variables, we use sequential analysis to observe their logical effects (Cohen & Cohen, 2003, pp. 135–192). Model 1 is a baseline model, containing only variables of cultural and symbolic attributes. Beyond individual cultural and symbolic variables, individual socioeconomic variables are entered in Model 2 (Table 2a). Finally, variables on the economic characteristics of firms are entered in Model 3 (Table 2b). In the simplest form, the effects of each block of independent variables reflect the independent relationship of those variables to the likelihood of the choice to participate. The results are as follows.

Table 2a. Multinomial Logistic Model: Participation of Employees in ET (Total N = 3,474)

Variable	Model 1: Cultural and Symbolic Model					
	EET		IET		BOTH	
	B (SE)	Exp(b)	B (SE)	Exp(b)	B (SE)	Exp(b)
Intercept	-2.14(.27)***		0.19(.14)		-1.7(.20)***	
SEX						
Female (0)	0.58(.16)***	1.78	0.10(.09)	1.10	0.24(.10)*	1.27
Male(1)	0 ^a		0		0	
AGE						
Age 16–25 (1)	0.12(.23)	1.13	0.19(.14)	1.21	0.60(.17)***	1.82
Age 26–35 (2)	0.34(.23)	1.41	0.23(.13)	1.26	0.78(.16)***	2.17
Age 36 and above (3)	0		0		0	
EXPERIENCE						
No (0)	-0.13(.17)	0.88	0.01(.10)	1.01	0.07(.11)	1.07
Yes (1)	0		0		0	
SCHOOLING						
Lower secondary general ed. (2)	-0.34(.3)	0.71	-0.23(.15)	0.79	0.26(.20)	1.29
Upper secondary general ed. (3)	0.58(.25)*	1.78	0.30(.13)*	1.34	1.27(.17)***	3.56
Secondary vocational ed. (4)	0.67(.26)*	1.96	0.01(.14)	1.01	1.18(.18)***	3.25
Junior college (5)	0.55(.3)	1.73	-0.27(.18)	0.76	1.0(.21)***	2.78
4-year univ. and above (6)	0		0		0	
OCCUPATION						
Managerial staff (1)						
Professional staff (2)						
Clerks and office staff (3)						
Salespersons (4)						
Nonskilled workers (5)						
Nonskilled support staff (6)						
Floor skilled workers (7)						
W_CHANGE						
No (1)						
Not sure (2)						
3–4 times (3)						
5 and more (4)						
1–2 times (5)						
MOBILITY						
Downward mobility (1)						
Upward mobility (2)						
No mobility (3)						
-2LL_Final	7484.95					
Chi-square	186.37					
df	24					
p	0.000					

Table 2a. (Continued)

Variable	Model 2: Individual Socioeconomic Model					
	EET		IET		BOTH	
	B (SE)	Exp(b)	B (SE)	Exp(b)	B (SE)	Exp(b)
Intercept	−2.63(.46)***		0.31(.26)		−2.4(.33)***	
SEX						
Female (0)	0.43(.17)**	1.53	0.07(.10)	1.07	0.18(.11)	1.19
Male(1)	0		0		0	
AGE						
Age 16–25 (1)	0.40(.26)	1.49	0.30(.16)	1.35	1.06(.19)***	2.88
Age 26–35 (2)	0.43(.24)	1.53	0.25(.15)	1.29	0.89(.18)***	2.44
Age 36 and above (3)	0		0		0	
EXPERIENCE						
No (0)	−0.06(.172)	0.94	0.015(.11)	1.01	0.12(.12)	1.12
Yes (1)	0		0		0	
SCHOOLING						
Lower secondary general ed. (2)	0.27(.33)	1.31	0.05(.18)	1.05	1.05(.23)***	2.85
Upper secondary general ed. (3)	0.88(.27)**	2.42	0.47(.16)**	1.60	1.72(.20)***	5.60
Secondary vocational ed. (4)	0.94(.28)**	2.57	0.27(.17)	1.31	1.63(.21)***	5.09
Junior college (5)	0.50(.31)	1.66	−0.22(.20)	0.80	1.09(.23)***	2.97
4-year univ. and above (6)	0		0		0	
OCCUPATION						
Managerial staff (1)	0.40(.40)	1.49	−0.02(.24)	0.98	0.77(.27)**	2.16
Professional staff (2)	0.30(.34)	1.34	−0.34(.20)	0.71	0.24(.23)	1.28
Clerks and office staff (3)	0.11(.42)	1.12	−0.70(.27)**	0.50	−0.14(.30)	0.87
Salespersons (4)	0.84(.33)**	2.33	−0.53(.22)*	0.59	0.40(.24)	1.49
Nonskilled workers (5)	−0.60(.36)	0.54	−0.77(.20)***	0.46	−0.66(.23)**	0.52
Nonskilled support staff (6)	−0.25(.33)	0.78	−0.40(.19)*	0.67	−0.55(.22)*	0.58
Floor skilled workers (7)	0		0		0	
W_CHANGE						
No (1)	−0.28(.23)	0.76	−0.36(.14)**	0.70	−0.76(.20)***	0.47
Not sure (2)	−0.86(.23)***	0.42	−1.75(.15)***	0.17	−2.16(.20)***	0.11
3–4 times (3)	0.20(.20)	1.27	0.46(.12)***	1.58	0.68(.13)***	1.98
5 and more (4)	− ^b	—	4.05(.72)***	54.40	3.36(.73)***	28.66
1–2 times (5)	0		0		0	

(Continued)

Table 2a. Multinomial Logistic Model: Participation of Employees in ET (Total N = 3,474) (Continued)

Variable	Model 2: Individual Socioeconomic Model					
	<i>EET</i>		<i>IET</i>		<i>BOTH</i>	
	<i>B (SE)</i>	<i>Exp(b)</i>	<i>B (SE)</i>	<i>Exp(b)</i>	<i>B (SE)</i>	<i>Exp(b)</i>
MOBILITY						
Downward mobility (1)	0.38(.21)	1.47	0.24(.14)	1.27	0.38(.15)*	1.47
Upward mobility (2)	0.42(.19)*	1.52	0.38(.11)**	1.47	0.52(.13)***	1.68
No mobility (3)	0		0		0	
–2LL_Final	6656.76					
Chi-square	1014.56					
df	60					
<i>p</i>	0.000					

Notes: * = $p < .05$; ** = $p < .01$; ***, $p < .000$.

^aThe parameter is set to zero for reference.

^bThere is zero case for this cell.

Effects of Cultural and Symbolic Attributes. Model 1 contains *SEX*, *AGE*, *EXPERIENCE*, and *SCHOOLING* as the first block of independent variables to test whether these cultural and symbolic attributes have an impact on an individual employee's probability of participating in *EET*, *IET*, *BOTH*, or *NONE*. Since the Chi-square is of a significant level ($p < 0.000$), we can reject the view that all cultural and symbolic coefficients are 0. We conclude that cultural and symbolic attributes have an impact on the decision of employees to take up one of the options of ET.

Among four categories of choice to participate, *NONE* is used as the reference for comparison.⁴ Look at intercept, for example. The intercept for *EET* (-2.14^{***}) is the log of the ratio⁵ of the probability that a male employee with a university degree, thirty-six years old or above, who had work experience before coming to the current firm, will participate in *EET* to the probability of a male participating in *NONE*.⁶ Such a male employee is significantly less likely to take part in *EET*. In other words, he is more likely to be in the *NONE* group. The second intercept (0.19) is the log of the ratio of the probability of a male employee of the same type participating in *IET* to the probability of a male choosing *NONE*. The third intercept (-1.7^{***}) is the log of the ratio of the probability of a male employee of the same type participating in *BOTH* to the probability of a male of the same type participating in *NONE*. We reject the null hypothesis that the coefficients of males participating in *EET* and *NONE* are 0; so we reject the null hypothesis for *BOTH* and *NONE*. But we accept the null hypothesis that the coefficients of males participating in *IET* and *NONE* are 0.

Coefficients of females taking part in *EET* ($.58^{***}$) and *BOTH* ($.24^{*}$) indicate that female employees are more likely to take these ET options—about

1.78 times (see Exp (B)) and 1.27 times more likely than their male counterparts. With regard to *IET*, males are equally likely to participate in both *IET* and *NONE*, as are their female counterparts.

AGE parameter estimates have an interesting pattern. For those employees who participated in *EET* or *IET* only, the two younger age groups have the same probability as the third group, aged thirty-six and above. Therefore, we cannot reject the hypothesis that the coefficients are 0. Alternatively, we say that the three groups are equally likely to participate. As those participating in *BOTH*, the two youngest groups are more likely to participate. Those aged sixteen to twenty-five (.60***) and aged twenty-six to thirty-five (.78***) are 1.82 times and 2.17 times, respectively, more likely to participate in *BOTH* than those who are older. Work experience does not have any impact on choice of participation.

The coefficients of *SCHOOLING* show varied patterns for choices of participation. Of those participating in *EET*, the coefficients of the groups with a lower secondary school and junior college education show that these two groups, like the reference group (university graduates), are equally likely to be in the *NONE* group. The two coefficients of employees with twelve years of general education (.58*) and vocational education (.67*) are 1.78 times and 1.96 times, respectively, more likely to pay for *EET* than employees with a university degree. This group of coefficients indicates that education does not follow a linear pattern. Those with the least amount of education and those with the most are less likely to take *EET* as an option outside the firm. Those with only nine years of education are either less capable or less motivated to do so. Or with fourteen years of education (junior college) or more, they may have already acquired a great deal of basic knowledge and skills from their initial education.

With regard to *IET*, those with twelve years of general education are 1.34 times more likely to participate. Employees with other educational backgrounds have a pattern similar to that of employees with a university degree. We say that *IET* is extensively provided to employees to upgrade their job-related skills. The coefficients of *SCHOOLING* for *BOTH* indicate another pattern. Employees with nine years of education, as with those with a university degree, are less likely to participate. It is interesting that those with twelve years of general education and vocational education, and those with a junior college degree, are significantly more likely to take *BOTH*, at 3.5, 3.25, and 2.78 times, respectively. They put aside time and money for *EET*, in addition to participating in *IET*.

By using the intercept and coefficients of male and female, the youngest age group, and upper secondary general education, we estimate probabilities of participation in each of the ET options.⁷ The probabilities of female employees taking up each of the four ET options are .07 for *EET*, .40 for *IET*, .31 for *BOTH*, and .20 for *NONE*, respectively; and the probabilities of male employees are .05 for *EET*, .45 for *IET*, .27 for *BOTH*, and .19 for *NONE*, respectively.

In short, we can tell that employees taking up these four options of ET have different patterns of behavior. Female employees pay more for *EET* to learn job-related skills. The probabilities of participating in *IET* are very similar among employees, indicating that the employers disregard personal cultural attributes in the workplace. Those who are most keen to advance their competence for the job through participating in *BOTH* have different patterns of cultural and symbolic attributes: female employees and younger employees are likely to take *BOTH* options. An initial level of education of more than nine years has been an important quality of enabling one to take *BOTH* opportunities. Our findings are in accordance with the statement by Doray and Arrowsmith (1997, p. 59) that individuals with lower levels of educational attainment are much less likely to participate in ET. However, we find a pattern that differs from their statement that postsecondary education is associated with higher rates of participation. In our study, those with twelve years of general education are most active in taking up all three options of ET to upgrade their job skills.

Effects of Individual Economic Attributes. Model 2 estimates the effects of individual economic attributes. The Chi-square is increased from 186.37 to 995.78 (p value $< .000$). Thus, we accept that the coefficients of individual economic attributes are not 0. First, in terms of participating in *EET*, of all occupations, salespersons (.84**) are 2.33 times more likely than skilled workers to seek *EET*. Employees in all other occupations have a pattern similar to that of skilled workers on the floor. Salespersons work in a unique context in that they are often away promoting sales outside the firm. Courses from external ET institutions help them get to know the market.

The relationship between *OCCUPATION* and taking *IET* is interesting. Managerial staff (−0.02) and professionals (−.34) are equally likely to attend firm-provided *IET* as skilled workers. But the rest, clerks and office staff (−.70**), salespersons (−.53*), nonskilled workers (−0.77***), and other support staff (−0.40*), are less likely than skilled workers to take advantage of firm-provided *IET*. These coefficients clearly indicate that those at higher ends of the occupational hierarchy have different ET opportunities than the rest at the middle and lower ends. With regard to *BOTH*, the findings are even more interesting. Managerial staff (.77**) are the group that are the most keen to keep their skills up-to-date in both the internal and external markets. Next are professionals, clerks, and office staff, and then salespersons; they behave in a manner similar to that of skilled workers on the floor. This accords with the findings in OECD countries that those at higher ends of the occupational hierarchy, or within the primary sector of the internal market, are more likely to continue to take up ET opportunities (see Beganger & Valdiviels, 1997, pp. 101, 85, 61, and 119). Nonskilled workers (−0.66**) and support staff (−0.55*), at the bottom of job ladder, are the least likely to be interested in participating in both *IET* and *EET*. It is apparent that the patterns of ET opportunities are parallel to the hierarchy of the workplace. Those at the upper

levels of the hierarchy have the advantage in terms of ET opportunity. Coefficients for the last two groups, nonskilled occupations, take negative values in all three options of ET. These findings indicate that the distribution of ET opportunities reproduces the social and economic hierarchy in the workplace and puts those at the bottom at a further disadvantage in taking part in continuing job-related ET.

W_CHANGE refers to the intensity of the workplace changes experienced during the five-year period from 1991 to 1996. It is interesting to note that employees who were not sure whether they had experienced any changes were significantly less likely to take part in EET, as compared to the reference group, those who had experienced one to two instances of change. The intensity of experiencing change more or fewer times did not matter to the rest of the employees in considering whether to take up EET. It is assumed in our discussion (see the section titled Theoretical Framework) that participation in EET is more for fulfilling one's occupation aspirations. It seems that employees, therefore, disregard change in the workplace when taking the EET option. We reject Hypothesis 2b for EET that the greater the extent to which an employee experiences change in the workplace, the more likely he or she will be to participate in EET.

Comparatively, in the case of participating in IET, coefficients show a linear relationship with the intensity of the workplace change. Those who have experienced change three to four times (.46**) and five or more instances (4.05***) are more likely to take part in IET than those who have experienced change one to two times. In contrast, coefficients show negative values for those who have not experienced a change (−.36**) and for those who are not aware of what has occurred (−1.75***). In the case of seeking BOTH, the coefficients show exactly similar pattern. We accept Hypotheses (2b) for IET and BOTH: The greater the extent to which an employee experiences change in the workplace, the more likely he or she will be to participate in IET and BOTH.

It is noted that coefficients show negative values for those who have not experienced a change or who are not sure about what has happened in the workplace. These employees are not active in the firms' economic transition, nor are they likely to take part in ET to upgrade their job competence. Change or transition is also found as being a major indicator of whether a firm will adopt ET for human resource development and make expenditures in ET in other studies (Benson and Zhu, 2002; Smith & Dowling, 2001). The coefficients support our hypothesis (2b) that change has an impact on options for participating in IET.

Internal mobility indicates one's employability in a given firm. In both EET and IET, those who were upwardly mobile were more likely to take up ET than those who were not. Those who were downwardly mobile behaved in a manner similar to that of the reference group, who did not have any kind of mobility. In the case of the BOTH option, those with either upward or downward

mobility sought ET options significantly more than did the reference group. All of those who participated in *BOTH* were the most active and keen to look to both internal and external markets. The findings support Hypothesis 2c that upward mobility is positively associated with participation in ET. We also found that downward mobility was associated with positive participation among the most economically active group, those engaged in *BOTH*. Perhaps those with upward mobility have acquired the skills to stay competent on the job,; whereas those downward mobility are aware of the necessity to acquire job competence.

With these coefficients we can predict the probabilities of participation. Given a female employee who is in the youngest age group, has an upper secondary general education, has experienced change three to four times, and is upwardly mobile, we can determine that her probability of participating in each of the ET options is .05 for *EET*, .49 for *IET*, .39 for *BOTH*, and .07 for *NONE*, respectively. If she is a member of the managerial staff, the probabilities are .05 for *EET*, .33 for *IET*, .57 for *BOTH*, and .05 for *NONE*, respectively. We see that an individual's economic attributes in the workplace do alter patterns of participation in ET.

Model of the Economic Attributes of the Firm. With three firm variables entered in the multinomial model, the Chi-square increased from 1030.906 to 1148.305 ($p < .000$). We reject the null hypothesis that the coefficients of the economic attributes of a firm are 0. For *EET*, the coefficients of *SECTOR* indicate that employees behave in similar way when considering *EET*, regardless of whether their firms are in the manufacturing or service sector. Nor does firm size influence the decision of employees. However, the coefficients of *OWNERSHIP* show that employees in local private/collective firms and in those with investment from outside mainland China are significantly less likely to participate in *EET*. In other words, employees in corporate firms, like those in state firms, are more likely to take part in *EET*.

The coefficients of *SECTOR*, *SIZE*, and *OWNERSHIP* for participating in *IET* and *BOTH* show a similar pattern but are different from the pattern of coefficients for *EET*. First, employees in manufacturing firms are less likely to engage in *IET* ($-.34^{**}$) and *BOTH* ($-.28^{*}$) than those from the service sector. We accept Hypothesis 3a that employees in service sectors are more likely to participate in *IET* and *BOTH*. In the 1990s, Shenzhen adopted a strategy of focusing on tertiary industries to spearhead the city's economic development (see Liu, 1992). This pattern is in accord with the human resource efforts of firms in the tertiary sector. With regard to *SIZE*, it appears that employees in small firms have significantly fewer opportunities to take part in *IET* ($-.28^{*}$) and *BOTH* ($-.54^{**}$). But employees in medium and large firms are more likely to take advantage of the *IET* and *BOTH* options. This finding again supports our hypothesis and accords with the long-standing issue of the inability of small firms to provide and motivate employees to build up job competence (Lauder, 2001; OECD, 1991, ch. 5). In terms of ownership, employees in firms

Table 2b. Multinomial Logistic Model: Participation of Employees in ET (Total N = 3,474)

Variable	Model 3: Full Model					
	EET		IET		BOTH	
	B (SE)	Exp(b)	B (SE)	Exp(b)	B (SE)	Exp(b)
Intercept	-2.49(.49)***		0.37(.28)		-2.25(.35)***	
SEX						
Female (0)	0.34(.17)*	1.40	-0.02(.10)	0.98	0.07(.12)	1.08
Male (1)	0 ^a		0		0	
AGE						
Age 16–25 (1)	0.53(.27)*	1.70	0.39(.16)*	1.47	1.20(.20)***	3.31
Age 26–35 (2)	0.56(.25)*	1.76	0.35(.15)*	1.42	1.05(.18)***	2.86
Age 36 and above (3)	0		0		0	
EXPERIENCE						
No (0)	-0.01(.17)	0.99	0.06(.11)	1.06	0.14(.13)	1.15
Yes (1)	0		0		0	
SCHOOLING						
Lower secondary general ed. (2)	0.62(.34)	1.85	0.35(.19)	1.42	1.45(.24)***	4.27
Upper secondary general ed. (3)	1.04(.28)***	2.82	0.62(.16)***	1.85	1.87(.20)***	6.45
Secondary vocational ed. (4)	1.01(.28)***	2.75	0.35(.17)*	1.42	1.72(.21)***	5.61
Junior college (5)	0.59(.32)	1.80	-0.12(.20)	0.88	1.20(.23)***	3.32
4-year univ. and above (6)	0		0		0	
OCCUPATION						
Managerial staff (1)	0.69(.41)	1.99	0.28(.24)	1.32	1.09(.28)***	2.99
Professional staff (2)	0.42(.35)	1.52	-0.18(.21)	0.83	0.41(.21)	1.50
Clerks and office staff (3)	0.06(.44)	1.06	-0.63(.27)*	0.53	-0.11(.30)	0.89
Salespersons (4)	1.06(.34)**	2.89	-0.27(0.22)	0.77	0.65(.24)**	1.92
Nonskilled workers (5)	-0.40(.37)	0.67	-0.53(.21)**	0.59	-0.43(.24)	0.65
Nonskilled support staff (6)	-0.15(.35)	0.86	-0.29(.20)	0.75	-0.47(.24)*	0.63
Floor skilled workers (7)	0		0		0	
W_CHANGE						
No (1)	-0.17(.24)	0.84	-0.29(.14)*	0.75	-0.61(.17)***	0.54
Not sure (2)	-0.79(.23)**	0.45	-1.68(.16)***	0.19	-2.06(.20)***	0.13
3–4 times (3)	0.34(.20)	1.41	0.53(.13)***	1.70	0.78(.13)***	2.18
5 and more (4)	— ^b	—	4.05(.72).***	57.40	3.36(.73)***	28.56
1–2 times (5)	0		0		0	
MOBILITY						
Downward mobility (1)	0.38(.22)	1.47	0.22(.14)	1.24	0.38(.16)*	1.47
Upward mobility (2)	0.35(.19)	1.41	0.32(.11)**	1.38	0.45(.14)**	1.56
No mobility (3)	0		0		0	

(Continued)

Table 2b. Multinomial Logistic Model: Participation of Employees in ET (Total N = 3,474) (Continued)

Variable	Model 3: Full Model					
	EET		IET		BOTH	
	B (SE)	Exp(b)	B (SE)	Exp(b)	B (SE)	Exp(b)
SECTOR						
Manufacturing (0)	−0.34(.18)	0.71	−0.34(.11)**	0.71	−0.28(.13)*	0.76
Service (1)	0		0		0	
SIZE						
Large (over 801) (1)	−0.37(.24)	0.69	−0.28(.14)*	0.75	−0.54(.17)**	0.58
Medium (301 to 800) (2)	0.33(.19)	1.39	0.19(.12)	1.21	0.09(.14)	1.09
Small (300 or fewer) (3)	0		0		0	
OWNERSHIP						
Corporate (1)	−0.37(.22)	0.69	−0.40(.15)**	0.67	−0.46(.16)**	0.63
Private/collective (2)	−0.88(.28)**	0.42	−0.80(.17)***	0.45	−1.45(.21)***	0.24
Outsiders (3)	−0.46(.21)*	0.63	−0.06(.13)	0.94	−0.25(.15)	0.78
State (4)	0		0		0	
−2LL_Final	6538.79					
Chi-square	1132.54					
df	78					
p	0.000					

Notes: * = $p < .05$; ** = $p < .01$; ***, $p < .000$.

^aThe parameter is set to zero for reference.

^bThere is zero case for this cell.

with investment from outside mainland China are as likely to participate in *IET* as employees in the state-owned firms. In contrast, employees in the corporate firms (−.40** for *IET* and −.46** for *BOTH*, respectively) and local private/collective firms (−.80*** for *IET* and −1.45*** for *BOTH*) are less likely to take part in *IET* and *BOTH*. The coefficients did not support our hypothesis (3c) that those firms with investment from outside mainland China are more active in the case of *EET*, but they support the hypothesis it in the case of *IET* and *BOTH*.

As *NONE* is used as a reference group for comparison, the coefficients of the independent variables for *NONE* are simply coefficients that are opposite those for *EET*, *IET*, and *BOTH*. With careful examination, we summarize the characteristics of employees who are in the *NONE* group. First, employees aged thirty-six and above are more likely to withdraw from any type of ET. In terms of initial education, those with the least education (nine years) are more likely to be excluded from any type of ET. Employees with a junior college or university degree or above tend not to participate in *EET* and *IET*. Nonskilled workers and nonskilled support staff are most likely to be excluded from ET. Those who have not experienced change or are not sure about what happened

in the workplace are also more often excluded. Employees who have had no mobility are more likely to be nonparticipants. Employees in small firms are more likely to be in the *NONE* group. So are employees from private/collective and corporate firms. If their firms are in the tertiary sector and are large or medium-sized, employees are not likely to be nonparticipants. In short, employees that are disadvantaged in terms of cultural and socioeconomic attributes, or who work for firms that are not in the leading sectors, are more likely to fall into the nonparticipant group.

Finally, Table 3 lists tests of the likelihood ratios of the multinomial models. The upper panel shows the effects of each model. The first column lists the $-2 \log$ likelihood of the reduced model. The second column lists the chi-square values reduced by each model. For instance, the individual socioeconomic attributes model reduces an additional 828.20 Chi-square with an average Chi-square of 23.01 for each additional degree of freedom ($60 - 24 = 36$). Compare the reduced mean Chi-square by the cultural and symbolic model (7.8) and by the firm's economic model (6.55). We therefore conclude that of the three models, individual socioeconomic attributes contribute most to explaining the probabilities of employee participation in the different ET options. The lower panel shows the effects of each independent variable on the

Table 3. Likelihood Ratio Tests

<i>Effect</i>	<i>-2 Log Likelihood of Reduced Model</i>	<i>Chi-Square Reduced for Each Model</i>	<i>df</i>	<i>Sig.</i>	<i>Mean Chi-Square Reduced</i>
Intercept only	7671.322				
Intercept for Model 1 ^a	7484.95	186.37	24	0.000	7.77
Intercept for Model 2 ^a	6656.75	828.20	60	0.000	23.01
Intercept for Model 3 ^a	6538.79	117.97	78	0.000	6.55
Independent variables in final model					
SEX	6544.05	5.26	3	0.15	1.75
AGEGROUP	6582.30	43.52	6	0.00	7.25
EXPERIENCE	6540.33	1.55	3	0.67	0.52
Initial ED	6660.34	121.55	12	0.00	10.13
JOBPOST	6661.38	122.60	18	0.00	6.81
W_CHANGE	7164.89	626.10	12	0.00	52.18
MOBILITY	6553.26	14.47	6	0.02	2.41
SECTOR	6548.74	9.96	3	0.02	3.32
SIZE	6559.11	20.32	6	0.00	3.39
OWNERSHIP	6602.17	63.39	9	0.00	7.04

^aThis reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

final reduced model formed by omitting an effect from the final model. According to the table we accept the null hypothesis that the effects of *SEX* and *EXPERIENCE* are 0. We reject the null hypothesis that the rest of the parameters of their effect are 0. Among the independent variables, *W-CHANGE*, the workplace change has the greatest power to predict the probability with which employees will take up one of the options of job-related ET.

We conclude that cultural and symbolic attributes, socioeconomic attributes of individual workplaces, and firm characteristics do alter patterns of participation. The following are examples of predictions. For a male skilled worker who is in the youngest age group, who has an upper secondary general education, has experienced change three to four times, is upwardly mobile, and works for a large foreign-invested firm in the tertiary sector, the probability of participating in each of the ET options are .03 for *EET*, .45 for *IET*, .45 for *BOTH*, and .07 for *NONE*, respectively. But for a nonskilled male worker, aged thirty-six or older with only nine years of education, who has experienced no change in the workplace and no mobility, and who works for a small private/collective firm in the manufacturing sector, the probability of taking part in each of the four options are .01 for *EET*, .08 for *IET*, .00 for *BOTH*, and .90 for *NONE*, respectively. Those who are most disadvantaged are most likely to be in the *NONE* group. It is apparent that cultural and socioeconomic factors work together to keep this group at the bottom in terms of socioeconomic and resource opportunities, as is also observed by Cookson (1986).

Discussion and Policy Implications. As argued by Brown et al. (2001, pp. 29–34), the skill formation system is socially constructed. Our present analysis, using a case in a socialist market economy, illustrates that non–state-controlled ET systems have evolved to respond to demands from the internal market of firms, as well as to learning needs arising from personal occupational aspirations. The introduction of technology and economic reforms intertwined with the gradual withdrawal of state power in production operations has created zones for non-state action and has also exerted pressure on firms and their employees alike. Both firms and employees are found to be taking responsibility to develop job-related competence in their economic orientation. The findings suggest that firms take a major responsibility for providing job-related ET to two groups of employees: those in *IET*, who make up about 42 percent of the overall sample; and those in the *BOTH* group, who comprise about 25 percent of the sample and who, in addition, engage in self-paid ET outside of their firm (see Table 1 and discussion of the independent variable). About 7 percent of the sample takes part in external *EET* only.

This study supports the finding of Benson and Zhu (2002) that firms in China have adopted a *make-skill* approach by engaging in internal training as a major human resource strategy (pp. 461–463). Our study also suggests that because firm characteristics vary, opportunities for ET also vary. Differences in ownership, firm size, and sector may result in variations in financial capacity and economic structure. In this study, employees in state-owned firms and in

those with investment from outside mainland China have significantly more opportunities to take part in job-related ET. Being in the tertiary sector causes both firms and their employees to be confronted with rapid transitions, and employees of such firms are more likely to take up an ET strategy. Size of firms has long been considered relevant to whether employees are provided with ET (see the discussion in the Theoretical Framework section). Firm size has been associated with capacity for investment, and small firms are usually less capable than large ones (Daito, 1991). Because the development of employee skills is the key to a firm's success, the inability of small firms to provide IET to employees or motivate them to seek EET will continue to hamper them from competing with large firms.

Of all the individual attributes, the intensity of the changes experienced by employees in the workplace is the variable with the greatest predictive power, followed by schooling. Our findings support the argument that economic reform and increasingly sophisticated technology continuously put pressure on the workforce to maintain their competence and that the development of skills becomes the central concern (Hake, 1999, pp. 80–81; Jonathan & Winterton, 1997; Lauder, 2001, pp. 162; Belanger & Tuijnman, 1997, pp. 4–5). The secondary concern is the ability of employees to continuously acquire and apply skills and knowledge, which is acquired through initial education (Belanger & Tuijnman, 1997, pp. 4–5; Doray & Arrowsmith, 1997, pp. 59; OECD, 1996, pp. 131–132). In our study, twelve years of initial education is apparently a baseline for pursuing continuing learning in the workplace. The third concern lies in the reinforcement of social stratification in the workplace. The findings on the distribution of ET opportunities suggest that the occupational hierarchy in the workplace has a stratifying effect and allows those at the higher end of the hierarchy to take advantage of ET in the course of their career. This study also accords with the finding in OECD countries that adult learning is concentrated in the earlier phases of one's life and participation decreases with age (Doray & Arrowsmith, 1997, pp. 57–58). It is encouraging to find that there is not much difference in participation with regard to gender as far as IET is concerned, and female workers do make use of EET outside their firm if their learning needs are greater than can be satisfied by their firm.

Exclusion from ET systems has been an appalling issue, considering that more than one quarter of the sampled employees (27 percent) are nonparticipants. Most of this group are disadvantaged in many ways: 35 percent of the least educated are in this group (see Column 6, Table 1), as are 33 percent of nonskilled workers and 30 percent of nonskilled support staff; 34 percent of those who have not experienced change and 65 percent of those who are not sure what has happened are in this group, as well as 38 percent of those in small firms and 48 percent of employees in private/collective firms. These are the people who are least involved in transitions in the workplace, are at the bottom of the occupational hierarchy, and are hired in more marginal sectors.

The first concern is for the social and economic well-being of this group. A recent study (Desjardins, 2003, p. 31) in Canada suggests that if people devote less time to learning for reasons related to personal interest, there may be negative consequences for social well-being; at the same time, learning for job-related reasons has a positive effect on learning for reasons related to personal interest, which in turn has a positive effect on social well-being. The second concern of social exclusion is that these factors are woven into the fabric of labor markets. In the Chinese economic context, the study by Benson and Zhu distinguished high-value skills from low-value skills (2002, pp. 451–452). They found that a substantial proportion of managerial and specialist positions is filled through internal training, whereas lower-skilled labor is purchased in the external market (2002, pp. 463–464). In our study, we found that the two nonskilled groups of employees were most likely to end up in the nonparticipation group. This structure will have a determining effect on the diffusion of knowledge and skills and will thus lead to the polarization of incomes (Lauder, 2001, p. 166).

This study has unearthed very interesting findings about the patterns of employee participation in job-related ET. It is encouraging that Shenzhen has developed ET systems to respond to the demands of the workplace and has provided 73 percent of the sampled employees with access to different ET options during the five-year period under study. The findings contribute to the knowledge of the development of human resources in a socialist market economy in which both firms and employees have acquired the autonomy to act. The findings are in accord with the theoretical stance of the importance of education and training for the working population as a means for adjusting to change (Jarvis, 1985; Hake, 1999; Merriam & Caffarella, 1999). It is equally interesting to note that nonskilled employees at the lower end of the labor structure are often excluded from the newly emerging ET systems. If the competence of the workforce is one of the keys to economic growth and individual well-being, Shenzhen's case shall shed light policymaking regarding development of skills in the workforce. Interwoven with the labor markets, the outcomes of the system for supplying ET is paradoxical. A large number of job-related ET opportunities have been available to both firms and individuals, but a large number of employees at the lower end of the job hierarchy are blocked from taking advantage of these opportunities. These people may continue to function with low skills in an economy that demands a high level of skills, and their inability to upgrade their skills will hinder the development of a competent workforce. Considering that Shenzhen and other urban economies of China will continue to face pressure from a large number of low-skilled laborers migrating from rural areas, the provision of ET to this population will be a long-term challenge. A way must be found to topple the structural impediments that keep the low-skill population from bettering themselves. Expanding the range of people who can participate in IET and granting subsidies to employees who participate in EET are strategies that firms can pursue, as observed by Xiao and Tsang (1994).

Government subsidies to small or private/collective firms and ET programs offered by NGOs can definitely help to make ET opportunities available to the low-skilled population. Future study shall also make efforts to examine patterns of participation by the rural-urban immigrant population and self-employed small business entities. These are marginalized workforces in urban economy and seldom have received much attention.

Notes

1. The manufacturing firms included nineteen firms in electronics; eight in construction and construction materials; eight in household products such as clothes, shoes, bicycles, and jewelry; four in food and medicine; two in machinery; and one in electricity supply. The thirty-four service firms included eight firms in tourism (hotel and entertainment), six in trading, two in finance and stocking, eight in the wholesale and retail trade, three in transportation, two in telecommunications, and five in real estate.
2. Our study (Xiao & Tsang, 1999) reported the participation of the sampled employees in each of the following six types of IET. The first is entry-job training (28.9 percent), which consists of preparing new employees for assignments. The second is remedial training (3.4 percent), consisting of training in literacy, numeracy, and the basics of the job. The third is skill upgrading (43 percent). The fourth is new-skill training (7.9 percent), when firms change production technology or products and carry out reforms. The fifth is management training (16.3 percent) for managerial staff. The sixth is other types (7.9 percent), including firm culture and seminars. There are three types of EET. The first is short-term courses (3.9 percent) usually focused on a specific topic, such as using computer software. The second is medium-term programs (5.3 percent) to offer occupation certificates. The third is long-term programs (7.9 percent), usually for degrees or certificates. And a group employees indicated that they were participating in one of the three (13 percent) but were not sure as to which kind. Participation in both IET and EET programs are not exclusive of each other. For details, please read Xiao & Tsang (1999).
3. The multinomial model puts the last group as the reference group.
4. This multinomial model allows us to compare patterns of employees' choice or likelihood that different options will be taken simultaneously. As *NONE* is used as a reference category, the coefficients of *NONE* as compared to each of the three other options are just the opposite coefficients for each of the three ET options, *EET*, *IET*, and *BOTH*.
5. The first intercept is $\log(p(EET)/p(NONE))$, the second intercept is $\log(p(IET)/p(NONE))$, and the third intercept is $\log(p(BOTH)/p(NONE))$.
6. A male for *SEX* aged thirty-six and above for *AGE*, having work experience before joining the current firm for *EXPERIENCE*, and university education for *SCHOOLING* are used as the reference.
7. The probability is estimated in two steps: first calculate the values of the intercept and coefficients ($g_i = (\text{intercept}_j + \text{female}_j + \text{age}(1)_j + \text{schooling}(3)_j)$; and g_i reference = 0). For instance, $g_{EET}(\text{Female}) = (-2.14 + 0.58 + 0.12 + 0.58)$ and $g_{EET}(\text{Male}) = (-2.14 + 0.12 + 0.58)$. Then, for each group we calculate $P(ET_i) = \exp(g_i) / \{\exp(g_{EET}) + \exp(g_{IET}) + \exp(g_{BOTH}) + \exp(g_{NONE})\}$.

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