Research Article

Empirical Study on the Influencing Factors of Mobile Online Education Demand among China's New Generation Migrant Workers*

Xiaheng Zhang[1]
Northwest University of Political Science and Law

Xiao Li[2]
Northwest University of Political Science and Law

Abstract

For China's new generation migrant workers, mobile online education has become an important alternative for further education. Through structural equation modelling and random sampling survey, this paper empirically analyses the influencing factors of mobile online education demand of new generation migrant workers in China. It is found that individual characteristics have a significant impact on the working conditions and education cost of new generation migrant workers; Working conditions have a significant impact on the education resources and education cost of new generation migrant workers; Both education resources and education cost have a significant impact on the mobile online education demand of new generation migrant workers; However, individual characteristics have no significant impact on the education resources of new generation migrant workers, and education resources have no significant impact on the education cost of new generation migrant workers.

Keywords

New Generation Migrant Workers • Mobile Online Education • Demand • Structural Equation Model

[1]**Correspondence to:** Xiaheng Zhang (PhD), Business School, Northwest University of Political Science and Law, Xi'an 710122, China. Email: zhangxiaheng@163.com
[2] Business School, Northwest University of Political Science and Law, Xi'an 710122, China. Email: 981582566@qq.com

A hukou is a record in a government system of household registration required by law in China. The rural hukou holders born in the 1980s and working in urban areas are collectively referred to as new generation migrant workers. There are about 130 million new generation migrant workers in China. They have received better education and skills training than their parents, but still face immense difficulty in the job market due to the overall low level of education and training.

In human capital theory, education and training can increase human capital of labourers, and, in turn, solve the problem of income and transfer of rural labour force. As a development problem, the education and training of migrant workers has attracted the attention of numerous scholars. The existing studies show that the human capital of labour force is a key influencing factor of the non-agricultural employment of rural labour force and its mode choice (De Brauw *et al*., 2002). Nevertheless, the education and training of new generation migrant workers are confronted with many difficulties, such as small scale, backward content, poor organization and the shortage of teachers.

Fortunately, the Internet, as the biggest source of information, has provided migrant workers with abundant education resources to satisfy their varied learning demands (Yang, 2002). In particular, mobile online education can quench the thirst of new generation migrant workers for knowledge and skills. The open subject, interactive learning mode enables them to accumulate human capital and pursue a better life in cities.

Research Hypotheses

The new generation migrant workers, most of whom are manual labourers, generally possess bad quality, poor skills and low efficiency. It is not surprising that they have difficulty in adapting to themselves to the latest requirements of economic development. To overcome the difficulty, it is necessary for them to receive education and training, a series of activities designed to improve individual labour productivity and enhance core competitiveness (Lepak and Snell, 1999).

With the proliferation of the Internet, mobile online education has emerged as an effective means to address the diverse education and training demands of new generation migrant workers. The novel form of education is influenced by many factors, e.g. education content, learning time, education cost and education facilities. Moreover, new generation migrant workers may differ greatly on their demand of mobile online education, owing to individual characteristics and working conditions.

The influence of individual characteristics

Individual characteristics mainly encompass gender, age, education level, marital status and number of family members.

Gender: Because of the traditional division of labour, the labour force participation rate of men is higher than that of women. Traditionally, men have to face greater work pressure and bear more family and social

responsibilities than their female counterparts. Therefore, male migrant workers are more likely to participate in mobile online education.

Age: According to the life-cycle investing theory, age is positively related to the cost to recover human capital investment (Armstrong, 2014). With the increase of age, new generation migration workers, facing the surging recovery cost of human capital investment, prefer to settle for the current job rather than pursue further education.

Education level: The new generation migrant workers with higher education level are more interested in embracing new things and ideas, more willing to acquire new knowledge and skills, and readier to apply what is learned in practice.

Marital status: Marital status mainly sways the attitude of new generation migrant workers towards the stability of work (Wu, 2011). Compared to unmarried ones, the married new generation migrant workers, yearning to fulfil their family duties with a stable job, are more risk-averse and less willing to invest in human capital.

Number of family members: A large portion of new generation migrant workers belong to the sandwich generation. Such people, caught between kids and parents, bear a heavy family burden. Both childrearing and elderly care take up most of their energy, leaving little time or money for further education.

The influence of working conditions

Working conditions mainly refer to industry type, work income, work seniority, daily working hours and work intensity.

Industry type: China's migrant workers are concentrated in construction industry, manufacturing industry and service industry. These industries vary in access threshold and work quality. The higher the access threshold and work quality, the greater the demand for further education among new generation migrant workers.

Work income: The new generation migrant workers with low work income often live with poor working conditions and low quality of life. Dissatisfied with the present work and life conditions, they desire to change the status quo through further education. However, these migrant workers tend to participate in free or low-priced public welfare education projects, because of their low work income.

Work seniority: The new generation migrant workers with fewer work seniority have stronger job mobility at a lower cost. They are willing to improve work income and change the status quo through further education.

Daily working hours: The employees who work fewer hours a day are more enthusiastic about doing things other than daily work (Pedersen *et al*., 2012). This rule applies to the new generation migrant workers. Those with shorter daily working hours have more spare time to take part in further education.

Work intensity: In some labour-intensive industries or positions, it is easy for new generation migrant workers to get tired in work. In this case, the workers need to spend lots of time to relax themselves and recover their energy. Such people are less willing to accept mobile online education.

The influence of education resources

The education resources include education content, learning time and education facilities.

Education content: In the Research Report on the Development Status and Intergenerational Comparison of China's New Generation Migrant Workers, new generation migrant workers are eager to acquire knowledge on skills, law, and culture (Liu, 2009). The demand for these specific contents comes from their work and life experience. First, many new generation migrant workers are not content with their work content, environment and income. The root cause of these problems often lies in the lack of professional skills. Second, it is unavoidable for new generation migrant workers to face legal problems, such as labour disputes, protection of rights and interests, etc. Third, the familiarity with culture norms can help them to find better jobs in cities.

Malcolm Knowles, an American Adult Educator, points out that the learning content of adults is limited by the changing social tasks, and that learning is for the actual use of knowledge. The pursuit of education and training among new generation migrant workers is directly motivated by the longing for a decent job (Liu, 2009). Therefore, the contents of mobile online education must meet the content demand of new generation migrant workers.

Learning time: Education or training is a time-consuming process. New generation migrant workers must spend much time in online learning, even though the mobile online education has transcended the spatiotemporal limits of traditional education models. The amount of free time that new generation migrant workers can devote to education or training varies with individual characteristics and working conditions.

Influence of education cost

Despite the tendency to participate in free or low-priced public welfare education projects, new generation migrant workers still have to acquire the knowledge on skills, law and culture through high-quality paid education. In order to receive mobile online education, new generation migrant workers need to pay the content cost, facility cost, and opportunity cost. The content cost stands for the fees charged for education contents; the facility cost means the cost incurred in the use of mobile devices and the Internet; the opportunity cost arises because new generation migrant workers cannot work or engage in other activities when they participate in mobile online education.

Based on the above analysis, this paper puts forward the following hypotheses:

H1: Individual characteristics have a significant impact on the mobile online education demand of new generation migrant workers

H1a: Individual characteristics have a significant impact on the working conditions of new generation migrant workers

H1b: Individual characteristics have a significant impact on the education resources of new generation migrant workers

H1c: Individual characteristics have a significant impact on the education cost of new generation migrant workers

H2: Working conditions have a significant impact on the mobile online education demand of new generation migrant workers

H2a: Working conditions have a significant impact on the education resources of new generation migrant workers

H2b: Working conditions have a significant impact on the education cost of new generation migrant workers

H3: Education resources have a significant impact on the mobile online education demand of new generation migrant workers

H3a: Education resources have a significant impact on the education cost of new generation migrant workers

H4: Education cost has a significant impact on the mobile online education demand of new generation migrant workers

Research Design

Research method

Structural equation modelling (SEM) is an empirical analysis method that presents the objective state of things via causal hypothesis, and verifies the hypothesis with quantitative data. It is suitable to solve many social science problems that cannot be effectively solved in traditional statistical analysis. Such problems include the relationship involve multiple reasons or results or variables that cannot be observed directly. Moreover, the SEM can handle multiple dependent variables simultaneously, ensuring that the analysis of one variable will not be affected by other variables.

The 5-level Likert scale was adopted in the design: {1,2,3,4,5} = {strongly disagree, disagree, neither agree nor disagree, agree, strongly agree}. The reasons for adopting a 5-level scale are as follows. If there are too many evaluation levels, it will be difficult to determine the level of the object based on semantic differentiation ability; if there are too few evaluation levels, it will be difficult to meet the quality requirements of fuzzy comprehensive evaluation. To obtain accurate evaluation results, the number evaluation levels should be neither too many nor too few.

Model building

Based on the previous research and the above hypotheses, the mobile online education demand of new generation migrant workers was constructed as follows (Figure 1).
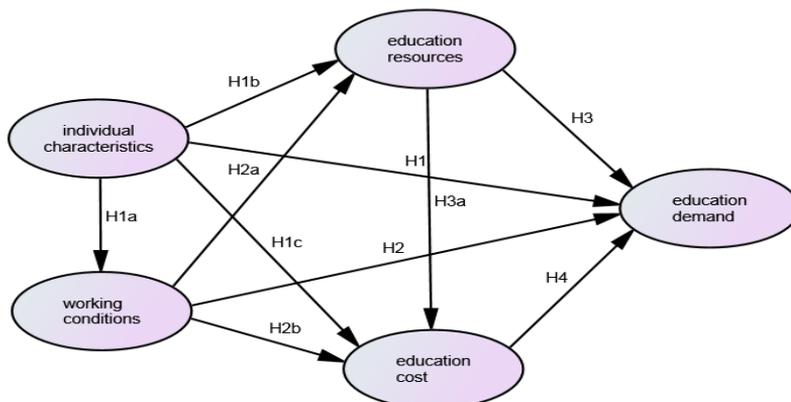
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Figure 1. Structural equation model.

Scale design

During the design of questionnaire, the variables were measured by the maturity scale proposed by Dodds *et al.*, in 1991, and the initial scale was determined through literature review, expert interview and the conditions of new generation migrant workers.

The initial scale was tested to verify its validity and reliability. According to the question classification method (Gary and Izak, 1991), the test was divided into four rounds, each of which involves two people. Since each person can only participate in a round, a total of 8 new generation migrant workers were invited to the test. The specific test procedures are as follows: (1)Arrange the measurement indices in a random order; (2)Ask the test personnel to divide all the measurement indices into four categories; (3)Ask the test personnel to evaluate the weight of indices in each category; (4)Correct the unclear expressions of indices based on the results of the first two rounds; (5)Repeat Steps 3 and 4 according to the results of Steps 1 and 2, aiming to ensure the stability and effectiveness of the results.

In each round, two statistical items were examined, namely, hit ratio and Cohen's kappa. The hit ratio is expressed as: Hit ratio= the total number of accurate indices/the total number of measurement indices * 100% According to the standards proposed by Gary C. Moore and Izak Benbasat, any scale with a hit ratio>0.700 should be deemed as valid.

The Cohen's Kappa is to eliminate the impact of randomness on test results. According to the standards proposed by J. Richard Landis and Gary G. Koch in 1997, any scale with a Cohen's kappa >0.600 should be deemed as acceptably consistent, and any scale with a Cohen's kappa >0.800 should be deemed as excellently consistent.

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Table 1
Classification Test Results of Measurement Indices

Statistic	First round	Second round	Third round	Fourth round
Hit Ratio	0.77	0.82	0.89	0.93
Cohen's Kappa	0.81	0.88	0.92	0.92

The values of hit ratio of Cohen's kappa are shown in Table 1. With all hit ratios above 0.700 and all Cohen's kappas above 0.800, the proposed initial scale boasts good validity and reliability. Hence, the final scale was constructed (Table 2).

Table 2
The Final Scale

Code	Observed variables	Code	Measurement index
F1	Individual characteristics	Q1	Gender
		Q2	Age
		Q3	Education level
		Q4	Marital status
		Q5	Number of family members
F2	Working condition	Q6	Industry type
		Q7	Work income
		Q8	Work seniority
		Q9	Daily working hours
		Q10	Work intensity
F3	Education resources	Q11	Education content
		Q12	Learning time
		Q13	Educational facilities
F4	Education cost	Q14	Direct cost
		Q15	Indirect cost
		Q16	Opportunity cost

Data Analysis

Data acquisition

In total, 500 questionnaires were issued by random sampling principle to new generation migrant workers in Xi'an, Shaanxi, China. A total of 486 questionnaires were collected and 475 valid ones were obtained, putting the effective recovery rate at 95%. The respondents were construction workers, decoration workers, workshop production workers, salespersons, security guards, and dustmen from the construction industry, service industry and manufacturing industry. The number of samples exceeds 200, making it possible to conduct the SEM analysis (Mueller, 1997).

The data analysis and model validation were performed on AMOS 21.0 software. Since the latent variables are better depicted by observed variables, the validity of the model was tested by Cronbach's alpha analysis, Kaiser-Meyer-Olkin (KMO) test and Bartlett's test, which respectively provides factor loading, average variance extracted (AVE) value and validity.

Reliability and validity test

It is calculated that the overall Cronbach's alpha is 0.813 (>0.700), and the Cronbach's alpha of each measurement index is more than 0.700, indicating that the measurement tool has good reliability. The overall KMO is 0.822 (>0.700), the KMO of each measurement index is more than 0.700, and the Sig value of Bartlett sphericity test statistic is less than 0.01. This means there is a significant correlation among variables, paving the way to factor analysis.

In factor analysis, the main tools are principal component analysis and Varimax orthogonal rotation. The factor loading of each measurement index was greater than 0.500, the overall Cronbach's alpha was more than 0.700 and the AVE was above 0.500. The results demonstrate good convergent validity. Based on the above analysis, it is believed that the measurement indices have passed the reliability and validity test.

Fitness analysis

The absolute adaptation statistic was employed to analyse the fitness of the measured data and the structural equation model. The selected statistics include chi-square values, GFI, IFI, CFI, RMR, and RMSEA. The results are listed in Table 3. It can be seen that the model has a reasonable overall fitness, that is, the model is compatible with the actual measured data.

Table 3
Test Results of Goodness of Fit

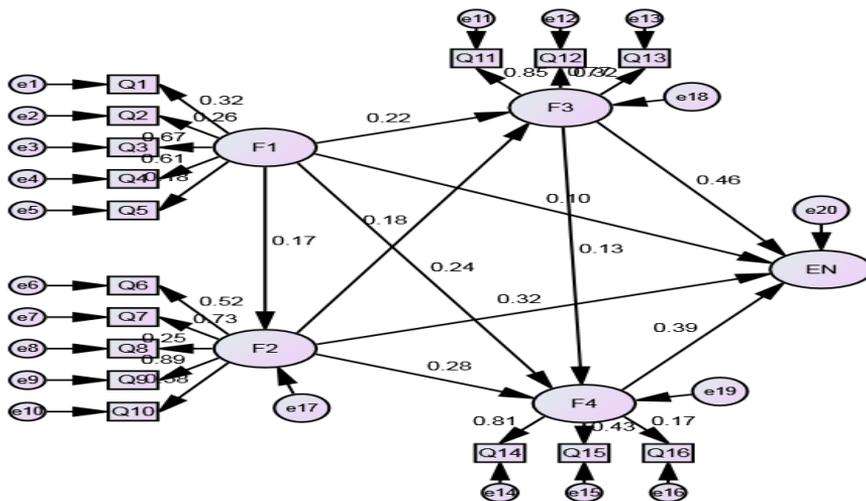| Statistic	chi square values	GFI	IFI	CFI	RMR
Index value	p=0.283	0.917	0.933	0.915	0.026
Standard	p > 0.05	> 0.90	> 0.90	> 0.90	< 0.05
Fitness analysis	Reasonable adaptation	Reasonable adaptation	Reasonable adaptation	Reasonable adaptation	Reasonable adaptation

Figure 2. Standardized estimation model.

Hypothesis validation

The SEM hypotheses were tested on AMOS21.0 software, a standardized estimation model (Figure 2), and the test results are presented in Table 4.

A hypothesis is valid if Estimate=0.2, Cronbach's alpha >1.96 and p<0.05, because the path coefficient holds under these conditions. Otherwise, the hypothesis is invalid if Estimate<0.2, Cronbach's alpha<1.96, and p > 0.05, because the path coefficient does not hold under these conditions.

Table 4
Hypothesis Test Results

Research hypothesis	Estimate	S.E.	C.R.	p	Result
H1	0.103	0.051	2.518	0.272	Refuse
H1a	0.075	0.048	2.331	0.083	Refuse
H1b	0.216	0.082	1.563	0.036	Refuse
H1c	0.241	0.068	4.216	***	Accept
H2	0.318	0.023	3.725	***	Accept
H2a	0.183	0.055	3.164	0.036	Refuse
H2b	0.283	0.072	2.853	0.005	Accept
H3	0.464	0.064	3.587	***	Accept
H3a	0.132	0.057	2.774	0.072	Refuse
H4	0.387	0.017	2.843	0.013	Accept

Note. "***" means P < 0.001; the size of P value is displayed if P > 0.001.

Through the analysis, hypotheses H1c and H2, H2b, H3 and H4, H1 and H1a were accepted and hypotheses H1b and H3a were rejected.

Conclusion

To sum up, individual characteristics have a significant impact on the working conditions and education cost of new generation migrant workers; Working conditions have a significant impact on the education resources and education cost of new generation migrant workers; Both education resources and education cost have a significant impact on the mobile online education demand of new generation migrant workers; However, individual characteristics have no significant impact on the education resources of new generation migrant workers, and education resources have no significant impact on the education cost of new generation migrant workers.

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