



## Original Article

# Factors Influencing Learning Satisfaction of Migrant Workers in Korea with E-learning-Based Occupational Safety and Health Education



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## ABSTRACT

**Background:** E-learning-based programs have recently been introduced to the occupational safety and health (OSH) education for migrant workers in Korea. The purpose of this study was to investigate how the factors related to migrant workers' backgrounds and the instructional design affect the migrant workers' satisfaction with e-learning-based OSH education.

**Methods:** The data were collected from the surveys of 300 migrant workers who had participated in an OSH education program. Independent sample *t* test and one-way analysis of variance were conducted to examine differences in the degree of learning satisfaction using background variables. In addition, correlation analysis and multiple regression analysis were conducted to examine relationships between the instructional design variables and the degree of learning satisfaction.

**Results:** There was no significant difference in the degree of learning satisfaction by gender, age, level of education, number of employees, or type of occupation, except for nationality. Among the instructional design variables, "learning content" ( $\beta = 0.344, p < 0.001$ ) affected the degree of learning satisfaction most significantly, followed by "motivation to learn" ( $\beta = 0.293, p < 0.001$ ), "interactions with learners and instructors" ( $\beta = 0.149, p < 0.01$ ), and "previous experience related to e-learning" ( $\beta = 0.095, p < 0.05$ ). "Learning environment" had no significant influence on the degree of learning satisfaction.

**Conclusion:** E-learning-based OSH education for migrant workers may be an effective way to increase their safety knowledge and behavior if the accuracy, credibility, and novelty of learning content; strategies to promote learners' motivation to learn; and interactions with learners and instructors are systematically applied during the development and implementation of e-learning programs.

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## 1. Introduction

In Korea, the demand for migrant workers began to increase rapidly in the mid-1980s, fueled by the high-speed growth of domestic companies, an upward trend in wages, and the imbalance between supply and demand in the industrial workforce (construction, mining, manufacturing, etc.). This demand initiated an increase in the influx of illegal migrant workers in a variety of basic industries, such as manufacturing, construction, agriculture, and

fishing. In November 1991, foreign industrial technology trainees were invited to Korea via overseas affiliated companies related to overseas investment, technology provision, and facility exports. In December 1993, the industrial trainee system was implemented, and in 2004, the newly introduced employment permit system was enforced in conjunction with the existing industrial trainee system. In 2007, the industrial trainee system was abolished and unified into the employment permit system. This system is a foreign manpower introduction policy, under which companies that intend

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to employ foreign workers due to the shortage of appropriate domestic workers submit a proposal to the government (the Minister of Employment and Labor). The government then reviews the feasibility of that proposal and decides whether to approve it or not. This system allows foreign workers with basic skills to enter Korea and get a job under the nonprofessional employment (E-9) status for 3 years. This system is currently implemented in most European countries and the USA.

As of December 2010, 1,261,415 foreigners were residing in Korea, including 1,092,900 legal residents (86.6%) and 168,515 illegal residents (13.4%) [1], accounting for about 2.5% of the country's total population of 50,515,666 [2]. Meanwhile, the number of migrant workers in Korea reached nearly 768,000 by the end of December 2010, which was 1.78 times more than that in 2005 [3]. These migrant workers made up 3.1% of the economically active population in Korea. Among the migrant workers in Korea, the number of industrial accident victims totaled 16,051 during the 3 years from 2008 to 2010, with 314 of them being killed. Notably, the number of industrial accident victims among the country's migrant workers has gradually increased from 3,967 to 5,599 between 2007 and 2010 [4].

According to the Occupational Safety and Health (OSH) Act, production workers are entitled to receive at least 2 hours of OSH education each month, which is provided after business owners submit an application to the Korea Occupational Safety and Health Agency (KOSHA) [5]. The OSH education programs were implemented in the classrooms of OSH education institutions or at the site of workplace especially for construction workers. Face-to-face lectures on OSH education generally reminded workers of basic OSH-related knowledge. However, business owners are likely to increase their profits if their migrant workers remain at work during the hours reserved for OSH education, and therefore, in reality, they rarely make voluntary applications to KOSHA. In addition, a substantial number of migrant workers are easily placed into a situation where they teeter on the borderline between legitimacy and illegitimacy, and cross between the legal positions of "stay" and "deportation" during their employment period. This means workplaces with unregistered migrant workers either do not apply for OSH education or are reluctant to receive it, as the workers are at risk of being placed in a situation where their identity can be revealed. Thus, such workplaces easily remove themselves from the OSH education network. An additional problem is that the OSH education for migrant workers requires an interpretation service to ensure that the migrant workers of various nationalities are taught in their native languages [6–8].

Owing to such problems, the OSH education of migrant workers to date has been extremely limited. Therefore, the incidence of industrial accidents among migrant workers has remained much higher than that for Korean workers [9]. The Occupational Safety and Health Research Institute (OSHRI) surveyed 2,050 migrant workers nationwide from April 12, 2010 to May 31, 2010, to compare and analyze the opinions of migrant workers about the existing OSH education. About 40% of the respondents said that they had not received OSH education in the previous year. The number of OSH education sessions they had after entering Korea was one (55.4%), two to three (26.7%), four to five (7.5%), six or more (10%), or nonresponse (0.4%) suggesting that OSH education is not properly conducted in workplaces [10]. However, several prior studies indicated that OSH education would be effective in preventing and reducing industrial disasters in workplaces [11–13].

Migrant workers' participation in OSH education in Korea was limited because of employers' reluctance, identification exposure, language, and so on. In this situation, e-learning-based OSH education can be an effective way to increase migrant workers'

participation in OSH education. In Korea's educational field, some companies and universities began introducing e-learning-based education around the mid-1990s. Recently, e-learning-based education is utilized in a wide range of educational fields, including early childhood education, elementary and secondary education, higher education, and corporate education. E-learning refers to a type of education provided mainly by utilizing the Internet based on various computer and web technologies, such as CD-ROM, wired and wireless communication technologies, mobile devices, Internet-based cyber space, and video conferencing [14].

E-learning can relax the restrictions of time and space compared with traditional face-to-face education. Learners can learn at any time if they are at a place where a computer and the Internet are available. Learners can also control the sequence and speed of their learning, and study a particular part of the learning content repeatedly, thereby interacting more actively with the learning content. As digitalized learning material can be modified easily, the newest information can be provided if necessary. Learners can freely participate in learning activities regardless of gender, race, or appearance [14,15]. Given these advantages and characteristics, the introduction of e-learning in the OSH education for migrant workers is likely to be a highly efficient solution to various problems and limitations, such as the difficulty in assembling scattered migrant workers at a place, illegal residents' reluctance to the traditional form of face-to-face education, language problems, and the need for prompt notification with regard to harmful and dangerous chemicals.

However, a lot of money and professional manpower need to be invested in order to develop an effective e-learning program. E-learning also requires a certain level of computer and Internet skills, and access to computers and the Internet [14,15]. According to a survey on 1,872 migrant workers in 2008 by the Korea Research Institute for Vocational Education and Training, 60.9% of the respondents answered that they preferred e-learning-based education to the traditional face-to-face format. In addition, the survey showed that 69.3% could use a computer and 43% had been using the Internet and e-mail [16]. Considering that the survey was conducted in 2008, it may be assumed that most migrant workers who have recently entered Korea to work are equipped with the general level of skills and experiences for e-learning.

Previous research studies on e-learning indicate that learners' satisfaction and the results of learning are influenced by the learners' individual characteristics, learning content, learning environment, various types of interactions, and instructor characteristics with respect to teaching styles [17–21]. Among the learners' individual characteristics, learners' motivation to learn was proved to have a close relationship with learners' satisfaction in e-learning. Since learners' motivation to learn is related to the level of their willingness to learn the learning content, it directly affects the effectiveness and satisfaction of e-learning [17,22,23]. In addition, because e-learning requires the learners to have a certain level of computer and Internet skills, previous experience related to e-learning is an important factor for successful e-learning [15]. The learning content is a factor that indicates the qualitative level of a given program. The organization, usefulness of the learning content, and provision of practical examples can affect learners' satisfaction with e-learning programs [24,25]. The learning environment also has been regarded as an important factor for effective e-learning. This factor includes physical environment, stability of computer and Internet network, ease of use, media richness, and so on [26–28]. Interactions in online learning environments can be classified into three categories: interaction among learners, interaction between learners and learning content, and

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