Research on Core Curriculum Reform of Urban Rail Transit Operation Management Major under 1+X Certificate System ——
Take "Urban Rail Transit Ticket Management" as an example

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ABSTRACT. *The 1+X certificate system puts forward higher requirements for vocational colleges. The construction speed and development achievements of urban rail transit are eye-catching. In order to meet the talent needs of urban rail transit operation and management positions, fully consider the requirements of job ability and vocational skill level, take the "Urban Rail Transit Ticket Management" course as an example, in terms of course positioning, course content, course skill objectives and course assessment, etc. , incorporate the competency requirements of urban rail transit ticketing jobs and the primary, intermediate, and advanced skill levels in the field of ticketing operations in the "Urban Rail Transit Station Vocational Skill Level Standard" into the curriculum. Strive to achieve the goal of improving the quality of personnel training for urban rail transit operation and management students, and students can quickly adapt to rail transit operation and management positions after graduation.*

KEYWORDS: *1+X Certificate, Major in Urban Rail Transit Operation Management, Urban rail transit ticket management*

1. Introduction

The State Council's "National Vocational Education Reform Implementation Plan" clearly pointed out: In vocational colleges and applied undergraduate colleges and universities, launch the pilot work of the "Education Certificate + Vocational Skill Level Certificate" (ie 1+X certificate) system [1]. The system encourages students to actively obtain certain vocational skill level certificates (ie "X") required by their major while obtaining academic certificates (ie "1") [2]. In response to the call of the country's "1+X certificate" system, all majors in vocational colleges re-examine the established curriculum standards, fully consider the requirements of the required abilities of the position and the requirements of the vocational skill level

certificate, and the course content, course skill requirements, and course assessment method has been reformed to ensure the rationality of the curriculum standards.

2. Analysis of demand for urban rail transit operation and management professionals

As of June 30, 2020, a total of 41 cities in Mainland China have put 6917.62 kilometers of urban rail transit lines into operation [3]. In 2019, the total length of newly-added operating lines was 974.8 kilometers. According to the standard ratio of 1:60 in the international rail transit industry, the demand for new talents in 2019 was 58488. It can be seen that the demand for talents in the urban transportation industry is extremely large.

Urban rail transit operation management positions include first-line positions such as station attendants, flight attendants, dispatchers, and equipment maintenance personnel. The urban rail transit operation management major is the main source of talents for urban rail operation management positions, and it is very important that its talent training specifications fit the needs of the enterprise.

3. Requirements for Professional Skills Certificate in Urban Rail Transit Operation Management

3.1 Classification of professional skills

The "Urban Rail Transit Station Service Vocational Skill Level Standards" released in March 2020 clarifies the station service vocational skill standards suitable for urban rail transit operation and management in higher vocational colleges, which are divided into three levels: elementary, intermediate, advanced, and three levels Progressively, high-level covers low-level vocational skills requirements [4]. Among them,

(1) The primary level is mainly for urban rail transit station platform operations, passenger consultation and service, ticketing equipment operation, safety inspections, order maintenance, and passenger guidance.

(2) Intermediate level is mainly oriented to the organization of train operation, train operation monitoring, station related equipment control, ticket operation and Automatic Fare Collection (AFC) equipment monitoring, construction management, etc. , in urban rail transit stations.

(3) Advanced is mainly for the supervision and management of train operation organization, passenger service, ticketing operation, basic operation and other fields in urban rail transit stations. When abnormal or emergency situations occur, the plan is activated, resources are coordinated, and on-site handling is directed.

3.2 Description of professional skill level requirements

The vocational skill level requirements of urban rail transit station services mainly include four work areas: train operation and construction organization, passenger transport service, ticketing operation, and emergency handling. Among them, the vocational skill level requirements for the ticketing operation field are shown in Table 1.

Table 1 Vocational skill level requirements in the field of ticketing operations [4]

Skill level	Work tasks	Vocational skills requirements
Primary	Ticket checking equipment operation	Ability to master the functions and precautions of automatic ticket vending equipment, and identify faults.
		Can use (semi) automatic ticket vending machines to sell tickets.
		Able to use semi-automatic ticket vending machines to analyze and process passenger tickets.
		Tickets for gates can be collected.
		Be able to answer passengers' questions about diversified ticket purchases, entry and exit, and provide relevant guidelines.
	Cash and bill management	Able to keep and transfer cash and bills correctly.
		Identification of counterfeit bills.
		Able to identify ticket violations.
	Passenger ticket transaction processing	Be able to judge the validity of the passenger's travel voucher, and guide and deal with it according to the nature of the certificate.
		Able to guide passengers holding various types of tickets according to different situations (including emergencies) and handle ticketing affairs.
Intermediate	Ticket checking equipment operation	The automatic ticket vending machine can be used to supplement one-way tickets, change cash, recover one-way tickets, cash drawers, and print out accounts.
		The station computer can be used to monitor and inquire about the status of automatic fare collection equipment.
		It can preliminarily judge card currency, card ticket and other faults through inquiring data in the background of automatic ticket vending machine.
		It can complete the emergency release operation of the turnstile under emergency conditions.
	Ticket organization	Able to organize ticketing work.
		Can complete the work of handover with bank cash.
		The ticket keys can be kept, used and handed over correctly.
		Can process long and short payment.
	Passenger ticket transaction processing	Can confirm and guide the handling of passenger ticketing affairs.
		Can confirm and guide ticket handling in emergency situations.
Advanced	Ticket organization	Be able to grasp the key points of ticketing security.
	Ticket security supervision	Can identify common ticket violations.
		Understand all kinds of common account inconsistencies.
		Understand the key points of ticketing safety supervision and prevention and control measures.

4. Research on the core curriculum reform of urban rail transit operation management major under the 1+X certificate system——Taking "Urban Rail Transit Ticketing Management" as an example

Higher vocational students have a relatively short time in school. Only by matching the vocational skills of the course and the vocational skill level certificate and reforming the professional core courses can the quality of graduate training be effectively improved to meet the requirements of enterprises and industries.

4.1 Course positioning

According to the "High Vocational School Urban Rail Transit Operation Management Major Teaching Standards", the urban rail transit operation management major sets "Urban Rail Transit Ticketing Management" as one of the core professional courses.

According to the vocational skill level requirements of urban rail transit station affairs, the overall goal of the course is positioned to enable students to master the professional terminology of ticketing and related management regulations. Master the composition and function of various ticketing equipment, and handle simple faults. Be able to deal with tickets, cash Ticketing keys, ticketing equipment, and ticketing report accounts in accordance with the regulations. Can provide ticketing services for passengers and complete the ticketing organization of the station. Through the study of the course, students are strengthened their sense of responsibility for the safety of life and property, the sense of standard operation in accordance with the process, and the sense of passenger-oriented service.

4.2 Course content

The formulation of the course teaching content fully considers the requirements of the course position ability and vocational skill level. According to the course positioning and course skill objectives, the teaching content is reasonably arranged as follows:

(1) Urban rail transit ticketing system, automatic fare collection system, and related professional terms for ticketing system.

(2) Automatic Fare Collection Clearing Center system (ACC), Line Center Computer system (LCC), Station Computer system (SC) and ticket terminal equipment.

(3) Urban rail transit ticket media and ticketing policies.

(4) The structure and function of Ticket Vending Machine (TVM), TVM operation and fault handling, Internet Ticket Vending Machine (iTVM) operation.

(5) Automatic Gate Machine (AGM) structure and function, AGM operation and troubleshooting.

(6) Booking Office Machine (BOM) structure and function, BOM operation and troubleshooting (including passenger ticketing transaction processing).

(7) Management of tickets, cash, ticket supplies, ticket keys and invoices, and account management of the ticketing system.

(8) SC monitoring system operation, SC ticket management system.

(9) Regulations and case analysis of ticketing violations and ticketing accidents.

4.3 Course skill objectives

The main teaching objectives of the course are enterprise employment-oriented, job skills and comprehensive quality as the core, master ticket management regulations, have the ability to operate ticket sales and check equipment, and handle simple faults.Be able to handle tickets, cash, ticket keys, ticket supplies, ticketing report account in accordance with regulations. Can provide ticketing services for passengers and complete the technical skills of station ticketing organization.

Through the study of the course, on the one hand, students will be familiar with the responsibilities, business content and processes of the docking positions such as the customer service center post and the passenger on duty, and have the vocational skills required for the job tasks. On the other hand, they should also be trained to have the job requirements professionalism.

The identified course skill objectives mainly include:

(1) It can operate ticketing equipment such as TVM, AGM, BOM, and can handle simple faults.

(2) Will fill in the ticket report.

(3) Able to properly manage tickets, cash, ticket supplies, ticket keys and invoices.

(4) Able to complete the work of handover with bank cash.

(5) Able to process long and short payment.

(6) Can provide ticket service for passengers.

(7) Master the key points of ticketing security.

(8) Be able to identify ticket violations and ticket violation operations.

(9) Ticket service can be provided in emergency situations.

4.4 Course assessment

The standard for measuring the quality of higher vocational education and teaching should not only pay attention to the theoretical "do you know", but also pay attention to the practical ability "will you do it". "Urban Rail Transit Ticketing

Management" is the core course of vocational ability training. The core of its assessment is that students can be competent for the corresponding positions and complete the job tasks.

The course adopts a variety of assessment methods such as written examination, practical operation, and scenario simulation. In order to improve students' employment competitiveness, awards or certificate results can be used to directly recognize and replace credits [5], as shown in Figure 1.
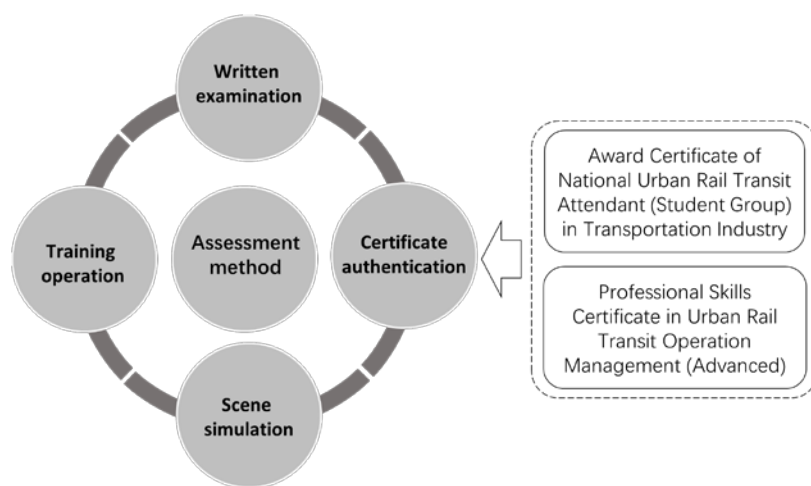

Figure. 1 Course assessment composition

5. Conclusion

In order to respond to the call of the national "1+X certificate" system and improve the quality of personnel training for urban rail transit operation management majors in higher vocational colleges, urban rail transit operation management majors should fully consider the requirements of professional core courses, job capabilities and vocational skills levels, carry out reasonable reforms based on the curriculum positioning and curriculum skills objectives, and strive to achieve the goal of quickly adapting to rail transit operation management positions after graduation.

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