

**COS10025 Technology in an
Indigenous Context
Semester 3 (May 2023)**



Research Report

Project Title: An information system for vocational training in ethnic minorities, Vietnam

Project Team: Group 5

Workshop: Tuesday morning (10 A.M. to 12 P.M)

Year: 2023

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PART A

Literature review

This literature review provides an overview of ethnic minorities in Vietnam, the current state of vocational training among ethnic minorities, and an investigation of information systems for vocational training around the world to design a solution for use in Vietnam.

Ethnic minorities in Vietnam

As of 2019, the Vietnamese population amounted to 96.2 million people and comprised 54 ethnic groups (General Statistics Office, 2019). The Kinh is the dominant group, making up 85% percent of the total population, while the other 53 groups are considered ethnic minorities. Despite constituting only 15% of the national population, they account for over 50% of poor households in Vietnam (Dung, 2023). Due to unfavorable economic conditions, geographical limitations, and fewer education opportunities, ethnic minorities mainly make money out of basic, low-skilled jobs.

Vocational training for Vietnamese ethnic minorities

From 2011 to 2020, the Vietnamese government implemented a plan to promote vocational training for laborers across the nation, also including those from ethnic minorities (Vietnamese Government, 2012). Do et al. (2020) find that the implementation of vocational training policies for ethnic minorities can enhance their wage opportunities. However, they also identify several shortcomings in the current implementation of vocational training among ethnic minorities. First, not many ethnic workers participate in vocational training and those who do tend to take short-term courses in agriculture. Second, the effectiveness of training in some regions does not meet expectations, with training being incongruent with workers' jobs. Third, organizing vocational training classes is difficult due to geographical challenges. These setbacks are attributed to a hesitation among older workers to learn new skills, an unwillingness to sacrifice time and immediate income, and a lack of mobilization from authorities. Solutions proposed include improving financial and geographical access to vocational training, supporting trainees in job seeking, liaising with the labor market to better understand employers' needs, and aligning training with the socio-economic needs and conditions of the region. Examining the vocational training situation in Northwest Vietnam, Dong and Le (2022)

conclude that trained ethnic workers have better job opportunities. They also believe that training programs need to be aligned with the key economic sectors of the region.

Do et al. (2020) analyze data collected through the Vietnam Household Living Standards Surveys between 2014 and 2018, so the results may not accurately reflect the present state of vocational training. The paper by Dong and Le (2022) investigates only the Northwest region of Vietnam. A more extensive investigation of all regions across Vietnam is needed to attain a more general understanding of the needs of ethnic minorities.

Information systems for vocational training

Akshay et al. (2012) designs a vocational training system to deliver learning via automobile units for rural India. Each vehicle contains a laptop server, a large screen, handheld devices installed with a special e-learning application, and other learning devices. The learning application delivers course content hosted on the laptop server in the form of video lectures and interactive workbooks. It gives learners the chance to learn theoretical knowledge and gain hands-on experience at the same time with haptic devices. The application also supports users with little digital literacy. Regarding the effectiveness of this project, the paper claims that 90% of participants believe it will improve their job prospects. However, this is speculative and may not reflect actual outcomes.

Soltan et al. (2020) develops an information system that personalizes the vocational training process based on trainees' traits. Trainees take four psychological diagnostic tests to get their learning pathway, which can be personally adjusted by trainees themselves and approved by teachers. By evaluating two learner groups, one using traditional methods and the other using the personalized method, they find that personalization improves learning outcomes. However, this paper does not specify the kinds of psychological diagnostic questions to ask, and its evaluation is conducted on a very small scale of only 53 people, which affects the validity of the result.

Turganbayev et al. (2021) propose a novel and comprehensive information system for vocational training in Kazakhstan that can provide vocational counseling, aid in school and job search, and predict labor demands. It provides trainees with “professiograms”, which are reference models that can be used to learn about the knowledge and skills, work conditions, and other information about a profession. The system also administers tests to provide career advice based on takers' characteristics and uses a top-down modeling approach to forecast

market demands. However, the labor forecasting feature depends on the reliability of other metrics and lacks sensitivity towards factors such as the business environment, working capacity, and professional mobility, a weakness that the authors admit.

The above information systems can inspire a solution for use among Vietnamese ethnic minorities. However, these systems do not account for the fact that some ethnic workers might not speak the dominant language – in this case, Vietnamese. A solution in Vietnam will have to cater to this language obstacle. Based on the findings above, we propose an information system for vocational training among Vietnamese ethnic minorities with the following features: (1) an easily navigable user interface, (2) labor market forecasting, (3) personalizable learning content, (4) course alignment with market demands, (5) career counseling, and (6) ethnic language support. These features will address the shortcomings of vocational training mentioned earlier.

Methodology

This section analyzes the research methodology employed by the examined papers.

The paper by Do et al. (2020) measures the impact of vocational training on the wages of ethnic workers. To achieve this, they use the Heckman Sample Selection Model on the data collected by the Vietnam Household Living Standards Surveys between 2014 and 2018. However, as the analyzed data is from 2014 to 2018, the results may not accurately reflect the present situation.

Dong and Le (2022) employ theoretical research methods to draw conclusions and historical research methods to examine development trends and propose potential solutions. For the historical method, they make use of secondary data published by the Vietnamese government in various outlets. However, since some of their conclusions are rooted in a theoretical basis, they might be different from what happens in reality. Additionally, the scope of their research is confined to Northwest Vietnam, so their findings may not reflect the situation in Vietnam generally.

Akshay et al. (2012) design and deploy a mobile vocational training system in remote communities in India after surveying the regions for environment, infrastructure conditions, and learners' demand and aptitude. The effectiveness of the system is estimated by the authors based on learners' opinions, which are subject to bias. Additionally, their research does not mention how many participants were involved in the project, so percentages may be unreliable.

Soltan et al. (2020) implement a vocational training system that allows the personalization of the learning content based on a series of psychological diagnostic tests, the content of which is not specified in the paper. The authors evaluate the effectiveness of their model by conducting tests on two learner groups: the controlled group learning by traditional means and the experimental group learning with personalization. However, their test is conducted on a very small scale (53 people) and only measure knowledge levels.

Turganbayev et al. (2021) evaluate their vocational guidance system by surveying 5,846 students in the city of Nur-Sultan. Students are given online self-assessment tests of their interests, aptitudes, and abilities. Data is collected across 12 professional areas, with each area being assigned a point. Higher points indicate a greater readiness to master the profession. They find that the results correctly reflect students' profession preferences and conclude that the system can be reliably used for vocational guidance.

PART B

Project background

Project Description

Investigation into the current state of vocational training among Vietnamese ethnic minorities reveals several shortcomings, including low participation rates, lack of learners' commitment, incongruence between training and actual jobs, and difficulty in organizing classes. For ethnic vocational training to be effective, access to programs should be enhanced, job finding for learners should be supported, and course content should be aligned with the demands and conditions of the region. We propose the creation of an information system to address these issues.

Problem Statement

How can the need for vocational training among Vietnamese ethnic minorities be addressed? For this, the project will create an information system for vocational training that is suitable for ethnic minorities. It should be accessible to people with low digital literacy and be available in multiple ethnic languages. The system should present content in a way that can be absorbed by ethnic trainees and cover a wide range of topics, not just agriculture. The system should also provide ethnic workers with career guidance and connect them to enterprises for employment opportunities.

Project Goals and Objectives

For this project to be successfully completed, five main goals will need to be achieved:

1. Build an educational platform prototype that is intuitive and easily navigable to deliver vocational training and knowledge to ethnic minorities, helping them achieve their full potential.
2. Formulate different requirements for each learning area and integrate them into the prototype.
3. Find the appropriate method of presentation so that the content is accessible to ethnic minorities with limited digital literacy.
4. Overcome the language barrier by finding methods to convey information to indigenous people with low proficiency in Vietnamese and English.

5. Offer a service that remains useful even in the event of unforeseen issues by giving explanation and guidance.

The main goals above can be broken down into the following list of objectives:

- Meet ethnic minorities in person to pinpoint the industry challenges they are facing.
- Conduct research to better understand issues within their community.
- Consult specialists on the subject to learn about existing solutions, their strengths, and weaknesses.
- Define the requirements for each learning area included in the vocational training platform.
- Build a prototype based on said requirements.
- Build a system to provide guidance in case the user needs assistance while using the platform.

Desired outcomes and benefits

Project outcomes

This project aims to produce a working prototype of a vocational training platform that can provide useful knowledge and skills in various disciplines to ethnic minorities in Vietnam. The platform will be intuitive to use and easily accessible even by users with low digital literacy. It will convey knowledge not only in the dominant language of Vietnamese but also in ethnic languages and other means. The platform also features a support service that can provide assistance when users encounter unexpected issues.

Benefits

This project will serve as a valuable source of vocational training material for ethnic minorities in Vietnam. It can be used for self-study purposes or as part of training programs. The knowledge and skills provided will help ethnic minorities catch up with the development of major cities, boosting their economy and enhancing their living standards. The platform's ease of use will help elevate levels of digital literacy among ethnic minorities, thus bridging the technological gap between ethnic communities and the dominant society.

People outside ethnic minorities can also benefit from this project. Since this project is open to all, everyone can access the learning content whenever they want. Creators of the learning content can learn more about the languages of ethnic groups while writing the material,

resulting in better cultural appreciation. The project developers can learn more about the cultures of ethnic minorities to design a system that best suits their needs.

Learning issue/problem (individual)

The learning issue that I have been assigned is vocational training to enhance tourism opportunities among ethnic minorities. For many Vietnamese ethnic communities, tourism is an important industry that generates jobs and income for households. However, the tourism workforce among minorities is still lacking in both quality and quantity. Workers need to be trained to fully exploit the regional tourism potential and leverage the power of information technology. The latter is especially important in the digital age where tourism workers can use the Internet to promote their regions and directly connect with tourists. Tourism is one of the industries that will be covered in our vocational training information system.

Project Scope and Exclusions

The project is meant to serve the interests of ethnic minorities in Vietnam, with a particular emphasis on students from primary level upwards and people of working age. The prototype will be designed around these demographics. Other groups of people can also use this application, but they will not be the focus.

In this project, the team will develop a working prototype of a vocational training platform with only the essential features, including the user interface, the support service, and other important technical features that will be decided on later in the innovation phase. The team will refrain from any unnecessary styling of the application and instead will focus on the key formatting needed to demonstrate the design philosophies of easy navigation and accessible interface.

As this is an educational platform, some learning content is expected to be available at launch. The team will provide some starting content based on the community issues investigated such as primary/secondary education, job training, tourism, and agriculture. However, this content is only meant for illustrative purposes.

Project Deliverables

The following are included as part of the project submission:

- A research report providing an outline of the project, a literature review, and other related information.
- An innovation concept report summarizing individual design concepts from team members.
- A project presentation explaining design ideas.
- A working prototype containing all essential features.
- A business case and reflection report featuring a summary of the project and a reflection on the work done.

Project Management Plan

Timeline

Task	Responsibility	Weeks									
		4	5	6	7	8	Sem. break	9	10	11	12
1: Project brief											
1.1: Writing the report	All										
1.2: Reviewing and finalizing	All										
2: Innovation concept											
2.1: Team meeting, discussion and task allocation	All										
2.2: Writing the innovation concept	Quang, Hoang, Dat, Tung										
3: Presentation											
3.1: Team meeting, discussion and task allocation	All										
3.2: Idea sketching	Kiet, Hoang										
3.3: Prototype building	All										
3.4: Preparing the presentation	Quang, Hoang										
4: Project final report	All										

Table 1: Project timeline

Goals and milestones

Goal: Conduct research about the project

Milestone 1: Determine the scope of research, including the target client of the project.

Milestone 2: Identify challenges (learning issues) faced by the target client by reviewing statistics, conducting interviews, etc.

Milestone 3: Define the goals, objectives, and benefits of the project.

Milestone 4: Review existing literature on the solutions to said community challenges.

Milestone 5: Identify a knowledge gap and suggest an innovative concept.

Milestone 6: Write a research report.

Goal: Formulate innovation concepts

Milestone 1: Individually brainstorm innovation concepts based on the assigned learning issues.

Milestone 2: Evaluate each individual innovation concept.

Milestone 3: Integrate ideas into an innovation concept report.

Goal: Deliver the project presentation

Milestone 1: Review and finalize all individual innovation concepts.

Milestone 2: Design the slides for the presentation.

Milestone 3: Deliver the presentation.

Goal: Develop the project prototype

Milestone 1: Design a rough sketch of the prototype by extracting ideas from individual innovation concepts.

Milestone 2: Allocate development roles to team members.

Milestone 3: Build a prototype containing essential features.

Goal: Writing the Business case and reflection report

Milestone 1: Write the project summary

Milestone 2: Summarize the project budget

Milestone 3: Reflect on personal work

Milestone 4: Reflect on group work

Milestone 5: Justify the successful achievement of unit learning outcomes

Team breakdown and duties

Our group has five members, and roles are allocated according to the following table:

<i>Name</i>	<i>Duty (team tasks)</i>
Nguyen Ha Huy Hoang	Team leader, writer of the innovation concept, idea sketcher, presentation designer, prototype developer.
Vu Quang Minh	Writer of the innovation concept, presentation designer, prototype developer.
Tran Khai Kiet	Idea sketcher, prototype developer.
Do Tuan Dat	Writer of the innovation concept, prototype developer.
Ta Quang Tung	Writer of the innovation concept, prototype developer.

Table 2: Role allocation

The table above shows the role allocation among all five team members for team assignments. I will be responsible for writing the innovation concept and developing the project prototype. Aside from team-based tasks, all members are expected to work on their individual project reports.

(2738 words)

References

- Akshay, N., Sreeram, K., Anand, A., Venkataraman, R., & Bhavani, R. R. (2012). MoVE: Mobile vocational education for rural India. *2012 IEEE International Conference on Technology Enhanced Education (ICTEE)*, 1–5.
<https://doi.org/10.1109/ICTEE.2012.6208644>
- Do, H. T. H., Mai, C. N., Mai, A. N., Nguyen, N. D., Pham, T. N., Le, H. T. T., Tran, M. D., & Vu, T. T. (2020). Impact of Vocational Training on Wages of Ethnic Minority Labors in Vietnam. *The Journal of Asian Finance, Economics and Business*, 7(6), 551–560.
<https://doi.org/10.13106/JAFEB.2020.VOL7.NO6.551>
- Dung, H. (2023, April 12). Giảm nghèo thông tin cho đồng bào dân tộc thiểu số. *VnEconomy*. Retrieved June 11, 2023, from <https://vneconomy.vn/giam-ngheo-thong-tin-cho-dong-bao-dan-toc-thieu-so.htm>
- General Statistics Office. (2020). *Completed results of the 2019 Viet Nam population housing census*. General Statistics Office. <https://www.gso.gov.vn/wp-content/uploads/2019/12/Ket-qua-toan-bo-Tong-dieu-tra-dan-so-va-nha-o-2019.pdf>
- Hong, D. T., & Giang, L. H. (2022). Vocational Training Models Based on Production and Business Activities to Develop Human Resources of Ethnic Minorities in the Northwest Provinces. *Jurnal Scientia*, 11(01), 557–564. Retrieved from <https://infor.seaninstitute.org/index.php/pendidikan/article/view/570>
- Soltan, G., Sarsenbayeva, G., Zunimova, G., & Erulanova, A. (2020). System to Support Personalized Learning. *2020 Ural Symposium on Biomedical Engineering, Radioelectronics and Information Technology (USBREIT)*, 492–495.
<https://doi.org/10.1109/USBREIT48449.2020.9117703>
- Turganbayev, Y., Adilgazinov, G., Barabanova, Y., Zhakupov, A., & Zhukibayeva, G. (2021). Information System for Vocational Guidance, Employment and the Forecasting of Labor Demand: The Case of Kazakhstan. *2021 IEEE International Conference on Smart Information Systems and Technologies (SIST)*, 1–6.
<https://doi.org/10.1109/SIST50301.2021.9465984>
- Vietnamese Government. (2012, May 29). *Approving the career development strategy for the period 2011 – 2020*. Viet Nam Government Portal.
<https://chinhphu.vn/default.aspx?pageid=27160&docid=159647>