

TIMO Model As The Basis For K-Workers: A Case Study On Pusat Komuniti Siber, Jitra

Ariffin Abdul Mutalib^a, Ezanee Hj Mohamed Elias^b and Jasni Ahmad^a

^aFaculty of Information Technology, Universiti Utara Malaysia,
06010 Sintok, Kedah
Tel: 04-9284611, Fax: 04-9284753
E-mail: am.ariffin@uum.edu.my, jasni@uum.edu.my

^bFaculty Management of Technology, Universiti Utara Malaysia,
06010 Sintok, Kedah
Tel: 04-9284792, Fax: 04-9284753,
E-mail: ezanee@uum.edu.my

ABSTRACT

Today it is widely recognized that Information and Communication Technology (ICT) is essential for society, government and commerce in economic, social, educational, and cultural. In line with the aspirations of Vision 2020, the ICT functions have envisioned the evolution of a value-based knowledge society in the Malaysian mole, where its society is rich in information, empowered by knowledge, infused with a distinctive value-system, and is self-governing. Government and private agencies have recognized the growing issues associated with inequitable ICT access and have provided funded programs have failed to deliver on their desired aims and that the societal and community based disadvantages. There have been a lot of programs created and promoted to embrace the usage of ICT such as Pusat Komuniti Siber (PKS), Satu Komputer Satu Rumah, SJ2005 (A Smart Community Programme In Subang Jaya) and Mobile Internet Clinic (MIU). This paper describes a research on a training program at a PKS where TIER model was used and the applied training model at PKS was found to be successful in terms of providing K-workers.

Key words

K-worker, PKS, Training, TIER, TIMO

1.0 INTRODUCTION

According to Turban et al. (2002) an Information System (IS) refers to the activity of collecting, processing, storing, analyzing, and disseminating

of information for specific purposes. The traditional discipline of IS is presently undergoing a major evolutionary step into societal applications. These evolutionary have changed from time to time started from electronic data processing (EDP) in late 1960-1970 to Community Informatics (CI) in year 2000 onward (Harris, R., 2002). He has proposed a discussion framework for the emergence of CI (table 1). The term CI refers to an emerging area of research and practice, focusing in the use of Information Technology (IT) by human communities.

IT can be defined as the technological components of an information system or collection of entire systems in an organization (Turban, et al. 2001). It links economic and social development at the community level with emerging opportunities in such areas as electronic commerce, community and civic networks, electronic democracy, self help, advocacy and cultural enhancement. CI brings together the concepts of IT and information systems with the concept of community development. The CI fostering the use and diffuse of the Internet networks as the major backbone of the system.

Table 1: Information Systems as an Emerging Discipline

Dominant Technology	Information Systems Locus	Work Group Focus	Dominant Referent Discipline	Scope
1960-70 Main Frame Computer	Electronic Data Processing	Clerical Staff	Computer Science	The Organization
1970-80 Mini Computers	Management Information Systems	Managers	Management	
1980-90 Personal Computers	End User Computing	Knowledge Workers	Organizational Behavior	
1990-2000 Networks	Strategic Information Systems	Shareholders	Economics and Marketing	
2000 onward The Internet	Community Informatics	Citizens	Social Science	Society

The CI is people who involved heavily in using the Internet as their major application in doing works, shopping and leisure. Thus, Information, Communication and Technology (ICT) has been treated more like a technology good in the sense of technology development, organizational efficiency, commerce and a service-delivery enhancer within an embedded culture of *homo economicus* (Taylor & Marshall, 2003) (Which underpins the free market doctrine assumes all individuals permanently display and make decisions on high levels of rationality, self interest and knowledge). For example: e-community, e-democracy, and e-public.

Meanwhile, Information Society is a form of community that are capable to gather, receive, produce and share the information which is to enhance the economy and social activity (Alatas, et al., 2000). Narimah & Musa (2001) say that these societies are people who have the desire to change from the non adoption of ICT to ICT owners. They are involved in several ICT activities such as using the words of information, technology and computer, use of computer in house or workplace, have the Internet technology and having seminar or receiving any computer courses.

IBM Community Development Foundation in its 1997 Report defines IS as a society characterized by a high level of information intensity in the everyday life of most citizens, in most organizations and workplaces; by the use of common or compatible technology for a wide

range of personal, social, educational and business activities, and by the ability to transmit, receive and exchange digital data rapidly between places irrespective of distance.

This research was done at Pusat Komuniti Siber (PKS) Parlimen Kubang Pasu, Jitra, Kedah where only three cohorts (in three slots) taken into account to be the respondents. The objective of this research is to investigate and form a training model applied at PKS Jitra and to examine whether the model used at PKS Jitra is successful in terms of producing Knowledge Workers (K-workers). Peter Druker (1959) defines that a K-worker is anyone who works for a living at the tasks of developing or using knowledge. For example, a k-worker might be someone who works at any of the tasks of planning, acquiring, searching, analyzing, organizing, storing, programming, distributing, marketing, or otherwise contributing to the transformation and commerce of information and those (often the same people) who work at using the knowledge so produced. Another definition of k-worker is they are people who use knowledge as a significant part of their work responsibilities (Turban et al., 2001). Reflecting to both definitions, k-worker can be defined as an individual or number of people who use knowledge and skills as major tools incorporated by computers to support their responsibilities in accomplishing work description.

This research was done using TIER model. There are a large number of researches done using TIER model. One of the examples is a

research done by Hammell et al. (2000) at United States Coast Guard (USCG) where he used pretest and posttest to generate findings towards the objective; to investigate the effectiveness of the training. Martin (2002) also used the same model to study the effectiveness of training. The study was conducted to examine the sales environment to determine key “need areas”. He also says that Northwest Airlines also uses the TIER model for the company towards the same reason. All researches above however did not come out with any training model probably they have already got their own reference model respectively. The model used in this research is elaborated in the following section. The model used at PKS Jitra, contribution, and conclusion including limitations and recommendation will follow the following section.

2.0 METHODOLOGY

The methodology used in this research is a model for research on training effectiveness (TIER). There are four stages involved in TIER; (1) Formative Research, (2) Process Research, (3) Outcome Research, and (4) Impact Assessment.

However, as the training is organized at PKS where there are a few staffs running the daily transactions including dealing with the course participants (i.e. respondents), the first two stages were considered as done by the PKS itself. In addition, the proposed time duration for this study is quite tight. Only stage three taken into full consideration. Stage four is not considered due to some reasons including time constraints, cost considerations and other limitations.

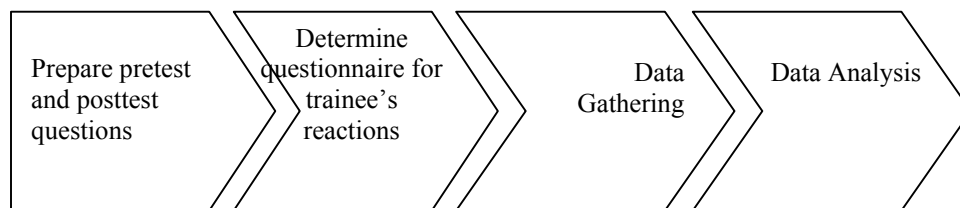


Figure 2: Method of Running the Research

Figure 2 depicts the steps involved in running the research at stage four of TIER model. There are four major steps (1) Preparing pretest and posttest questions; (2) Develop questionnaire for gathering trainee’s reactions; (3) Data gathering; and (4) Data analysis. All steps are further

described in the following sub sections respectively.

2.1 Pretest and Posttest Questions

During this step, the questions for seeing the difference of scores before and after the training are set up. In order to do that, all materials provided by PKS to the trainees were studied to ensure the reliability of the questions. The questions are same for pretest and posttest. As the training includes Ms. Word, Ms. Excel and Ms. Power Point, the questions covered in the tests including all the software. The tests consist of two sections; A – Multiple Choice Questions (MCQ) and B – Hands-on Tasks.

2.2 Questionnaire

The tests prepared as mentioned in section 2.1 are used to examine the level of understanding among the trainees. The means between tests are compared and interpreted accordingly. In order to get trainees’ reactions upon the training, another instrument is appropriate. A set of questionnaire was used for gathering trainees’ reactions. The University Training and Learning Center (UTLC), an institute at Universiti Utara Malaysia (UUM), has developed the questionnaire for the same purpose. UTLC has been using the questionnaire to assess the effectiveness of courses offered in UUM since March 2002. Consequently, the same questionnaire was used in this research. The difference exists in the questionnaire for this research is that a few more variables were added for meeting the objectives.

2.3 Data Gathering

Prior to gather appropriate data, the number of trainees was determined to decide whether to do population study or to do sampling. There were

two conditions, (1) if the population is greater than 150, than sampling has to be done, else (2) do population study. After getting information from the staffs attending PKS about the number of trainees involved, the decision could be made to do population study because there were only 123 trainees registered and taking the course. Having prepared with the tests' questions (and managed to touch-up as exam question sheets) and the questionnaire, the schedule for data gathering was set-up. Discussions were made with the staffs at PKS for that particular purpose. A few meetings were made to confirm the data gathering sessions. There are three slots per day i.e. morning, afternoon and evening (night) with different trainees in each slot. Accordingly there were three slots needed to run pretests. The pretests were conducted on the first day of course where trainees did not learn anything yet from PKS.

Having gone through the course and finished the training, the posttests were conducted. The posttests were also conducted in three slots for the same reason. As mentioned earlier, the questions asked are same with those of pretests. After answering the posttests, trainees were required to answer the questionnaire for gathering their reactions. Altogether, there are three instruments involved in data gathering. Figure 3 illustrates the instruments with the flow.

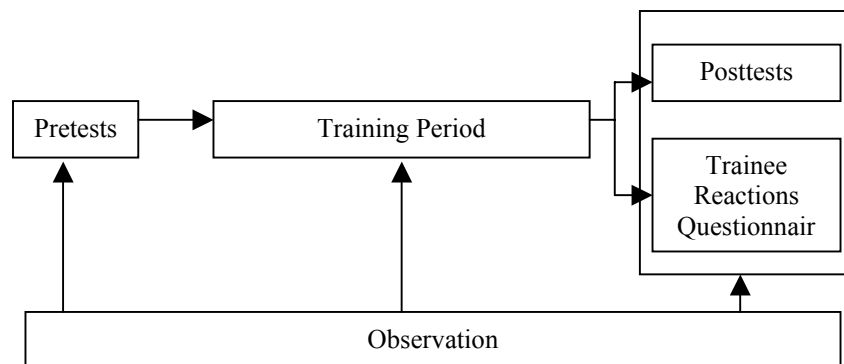


Figure 3: Instruments and the flow of data gathering

The questionnaire consists of three main sections; (1) Demographic background; (2) Trainees computer experience; and (3) Trainees reactions upon the course. Section three itself is further divided into seven subsections; (a) Overall of the Program; (b) Instructor; (c) Delivery; (d) Attention and Utilities; (e) Course Content; (f) Assessment; and (g) Motivation.

The questionnaire uses closed questions with **Likert Scales** system. This is to simplify the tasks in data analyzing. Observation was applied during the pretests, a few times during the training and during the posttests. All trainees' behavioral actions, facial expressions and speeches were written for further analysis (if necessary).

2.4 Data Analysis

As the data were gathered through pretests, posttests and trainees' reactions questionnaire, there comes the time to analyze the data. As this is a quantitative research, *SPSS* were used to find answers for priory-set questions. Descriptive analysis is the most suitable method for data analysis. The data collected through observations was also taken into considerations, especially in terms of the difference between shown during pretests and posttests.

3.0 TRAINING MODEL AT PKS JITRA

There were 27 male and 96 female trainees involved as respondents. As shown in Table 2, from 123 respondents, seven (6%) of them were below 17 years old. They were primary and secondary school children, sent to take the course by their parents and of self-encouragement. As the majority, youths between ages 18 to 21 years were 74 (60%).

Table 2: Number of trainees for each age group

Age	Frequency	Percentage
Below 17	7	5.7%
18 – 21	74	60.2%
22 – 25	19	15.4%
26 and above	23	18.7%
Total	123	100%

They were mostly freshly finished school i.e. after finished completing Sijil Pelajaran Malaysia (SPM)ⁱ and still waiting for the result, they want to prepare for their next level of education. 19 (15%) trainees were between 22 to 25 years old. While the rest 23 (19%) were 26 years and above. These trainees were working people in various fields including government and private sector, taking the course for implementing in the workplace.

There are three other modes of learning highlighted by Laurillard (1994) as shown in Figure 5.

The training model applied at PKS Jitra is further detailed by locating the interactions and discussions between trainees and trainers.

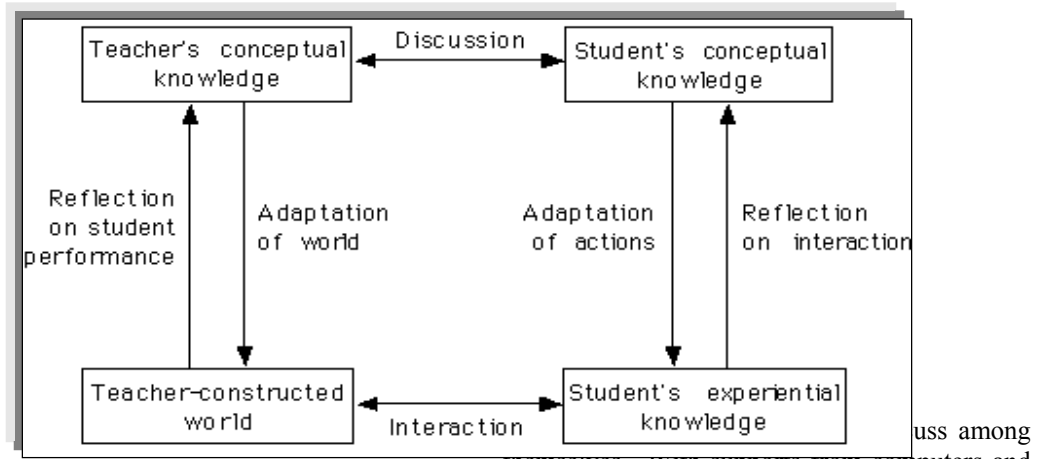


Figure 4: Essential Aspects of Teaching-Learning Process

From the trainees' demography, they were then formed into three different slots according to their own convenience. Basically, working people would choose to do at night, as well as students. Youths between 18 through 25 mostly choose to do during the day, morning and afternoon. At PKS Jitra, students are allowed and encouraged to discuss and interact with the trainers. Figure 4 depicts the essential aspects of the teaching-learning process (Laurillard, 1994). Trainees and trainers play as collaborators in the training program at PKS Jitra.

... among themselves, with supports from computers and other technologies such as LCD Projectors, the communications are made easier especially between trainers and trainees. In addition, there is a conversational framework proposed by Laurillard (access date: 28/9/03) identifying the activities necessary to complete the learning process. The framework is depicted in Figure 6.

Learning through discussion
Teacher and student as negotiator

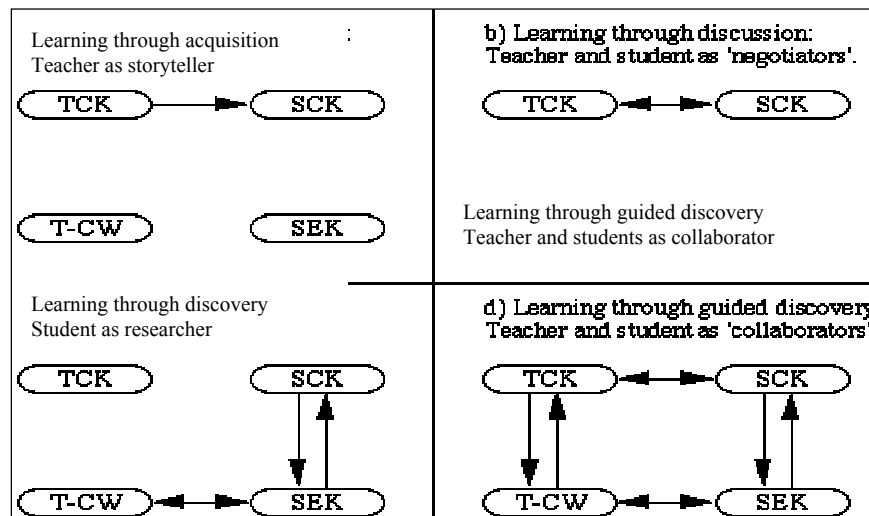


Figure 5: Modes of Learning: Trainer/Trainee Roles

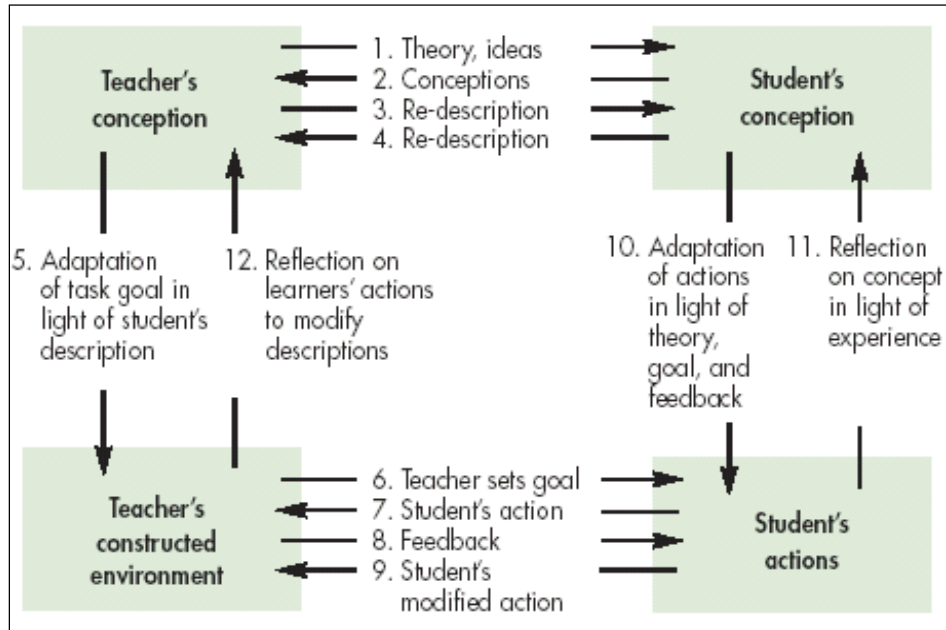


Figure 6: The conversational framework identifying the activities necessary to complete the learning process.

After the observation is accomplished (for all slots throughout the training program), all interaction styles are well understood. Information flows not only from trainers to trainees, but both ways. In fact, they discuss about many things along the training sessions.

The interaction names are changed to simplify the process of understanding the model because it is developed specifically for PKS Jitra. However, this model can also be used as reference by other training premises. The training model is named Training ICT Tools Modules (TIMO).

The training model can be illustrated as in Figure 7. The model in Figure 7 is actually containing all interactions in the model in Figure 6.

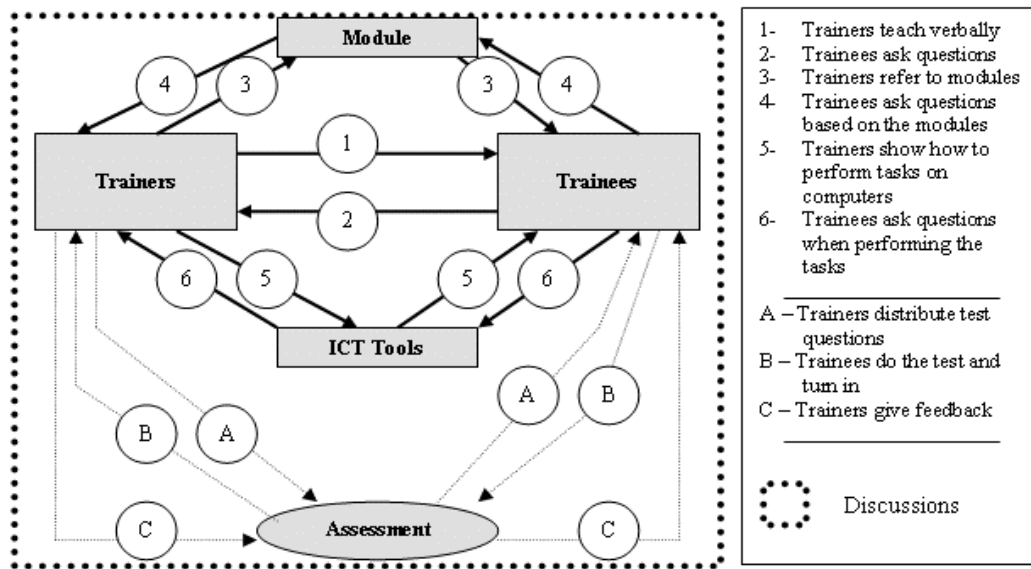


Figure 7: Training Model at PKS Jitra

In order to investigate the training effectiveness, pretest and posttest were used. Results for pretest and posttest were taken for analysis purposes. Table 3 shows the results for pretest and Table 4 shows the results for posttest.

Table 3: Pretest results

Grades	Frequency	Percentages
A	0	0%
B	0	0%
C	4	3%
D	119	97%
Total	123	100%

Table 4: Posttest results

Grades	Frequency	Percentages
A	27	22%
B	40	33%
C	56	46%
D	0	0%
Total	123	100%

From Table 3 and Table 4, it can be considered that the training model applied at PKS is successful in terms of producing K-workers. Trainees' reaction is taken into account for getting their feedback about the training premises and TIMO.

4.0 CONTRIBUTION

This research among others contributes to the development of a training model known as Training ICT Tools Modules (TIMO). TIMO is not only suitable for PKS Jitra, but also able to be applied in any hands-on-based training premises as the guideline.

5.0 CONCLUSIONS

From the research run through PKS Jitra, a few conclusions could be done on a few aspects. First, TIER model can be used to investigate computer training effectiveness. Second, the training model applied at PKS Jitra is successful. The research was done only at PKS Jitra, due to some constraints especially financial. This research model contains observation (as one of the components), so if the place is too far (from the researchers), it might cost a lot. TIMO model (Figure 6) has not been tested yet to investigate the strength. Doing investigation at a premise only is quite weak especially to do generalization. Accordingly, it is recommended that a further research on all PKS is done to investigate their training models and coming out

with a reference training model for all PKS. Another recommendation is to apply the TIMO model at any training premise to measure its strength. In order to do this, more budgets is needed.

REFERENCES

Alatas, Farid, S., Baber, Z., Evers, H., Menkhoff, T. & Ser, T. E. (2000). Knowledge Societies: An Overview of Issues and Theories. New York: The Free Press.

Borich, G., (1998), *Effective Teaching Method*, MacMillan Publishing Co., New York

Castells, M. (2000). Information Technology and Global Capitalism. In W. Hutton and Giddens, A (Eds). *On the Edge: Living with Global Capitalism*. London, Jonathon Cane.

Hammell, T. J. & Kingsley, L. C., (access date 11/6/03), *Nonresident Computer-based Training: Effectiveness Evaluation*, <http://www.rdc.uscg.gov/rdcpages/pubsandreports/NonresidCBTEval.pdf>

Harris, R. (2002). *Research Partnership to Support Rural Communities in Malaysia With Information and Communication Technologies*. In J. Lazar (Ed), *Managing IT/Community Partnership in the 21st Century*. Hershey, PA: Idea Group Publishing.

International Business Machine (IBM) Community Development Foundation (1997) Report: Information Society.

Laurillard, D. (access date: 28/9/03). *Rethinking University in The Digital Age*. <http://www.educause.edu/ir/library/pdf/ffp0205s.pdf>

Laurillard, D. (1994). *Multimedia and the changing experience of the learner*. In Proceedings of APITITE94 Conference, APITITE 94 Council: Milton, 1, 19-24

Martin, D., (2002), *Show Me The Result; Measuring the Effectiveness of Training is a Key Characteristic of Top 100 Companies*, Training, March, 39, 3

Narimah, I. & Musa, A. H.. (2001). *Towards K-Society: Are We Ready?* Working Paper

INFOSOC 2001, 14-15 June, Equatorial Hotel, Pulau Pinang.

NIOSH, (1999), *A Model For Research on Training Effectiveness*, NIOSH, Cincinnati, USA

Peter Druker, (1959). *The Land of Tomorrow*.

Rao, T. V., (access date 9/6/03), *The Training Effectiveness Questionnaire*, http://www.humanlinks.com/orgsn/training_effectiveness.htm.

Taylor, W. & Marshall, S. (2003). *Community Informatics Systems: A Construct For Addressing The Digital Divide*. Proceedings: The 3rd International Conference on Information Technology in Asia (CITA 2003), 17-18th July 2003, Kuching Sarawak, Malaysia.

Turban, E., Mc Lean, E., Wetherbe, J, Bolloju, N. & Davison, R., (2002). *Information Technology for Management: Transforming Business In The Digital Economy*. John Wiley & Sons, New York.

¹ Malaysian Certificate Education – the highest certification level at the secondary school.