

The Lack of IT on Post-Conflict Regions: Calls for Increased Technology in Education Systems – Case Study Kosovo

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ABSTRACT

Post conflict is a term for category of developing countries from civil war, recent conflict, or security crisis. From extreme damaged infrastructure, they require significant help to provide security and development. Post-conflict countries, other than developing ones, they have not received much attention on development in information technology (IT) and modern education. Lack of technology use has manifested in on lower productivity and innovation. Regions with major roles of IT face industrial revolution. Kosovo is a case study for this research investigation on post-conflict countries known also as new born countries (NBC). Research will investigate students in primary, secondary, and tertiary education. Literature cases draw concerns of poor performance.

KEYWORDS

Education, Information Technology (IT), Kosovo, Post-Conflict Countries

INTRODUCTION

The adoption of IT- based technologies in poor societies is very limited, thus resulting in lack of technological development. The differences that exist between IT adoption in developed and developing countries is quite evident, thus giving a specific advantage for developed nations in terms of economic growth. The United Nations has underlined IT as a key determinant in the development of the nation. The absence of IT hinders industrial development, and, hence, there is lack of development and comparison with IT-advanced nations. Post conflict nations require improvement and intervention in terms of security, economy, and technology development. To have a sustainable development, it is essential that such nations have a stable economy that is associated with an international arena. One of the most important elements that supports the economic development includes the application of information and communication technology (ICT). To attain ICT-based development, it is essential to have a proper education system that has scope for incorporating ICT-based approaches. A fundamental restructuring of education along with a revision of the existing education program to have an ICT-based curriculum is the need of the hour. To prepare a digital workforce, it is essential that students have practice related to IT.

Findings are relevant for most postconflict regions in transition, dealing with current and upcoming issues. Likewise, findings may change the perspectives of technology users and lead to higher-quality work in the digital millennium.

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Populated by under 2 million people in the heart of Europe/Balkan, Kosovo emerged from recent full-scale war. In 2000, a special peacekeeping mission was set up by the United Nations Mission in Kosovo (UNMIK). With a military presence, the country declared its independence in 2008 and was recognised by the majority of countries.

Kosovo has low economic stability and development, as it has recently emerged from conflict. Such problems mostly derive from people having minimal technological skills. Research alludes to proper IT education absence that leads to minimal workplace performance.

Further examination is encouraged for the questions:

- Is there is enough digitalisation available and used in industry of the post conflict region: Kosovo?
- Is there sufficient information technology used, investment in it, and knowledge, education, and practice in Kosovo, or is more needed?

Based on the autocratic system existing in the country, quantitative examination directly from students is considered the best way to conduct and is assumed to produce more accurate descriptions. Measures used in this study include capturing the level of digitisation and its availability in Kosovo. The extent up to which digitalisation is being used in the workplace in Kosovo is also evaluated in detail. The present paper investigates the extent of ITC in the industry and highlights the many shortcomings that have not been previously reported in literature.

Kosovo sits in the heart of Europe, but its economic development ranks among developing countries. Recently, it has been classified as a postconflict region, with damaged infrastructure in all areas, including technology, and suffering from insufficient investments. Findings show that productivity and performance is lacking in low-skilled technology employees. The facts draw attention to the situation and encourage an investigation into how much of these skills are being taught in the education system. This paper discusses the general technology in work environments in the country. An examination plan may shed light on the struggling economy that calls for regular use of technology by the younger generation.

IT refers to technology that helps produce, manipulate, process, store, and communicate information (Sawyar, 2005). For countries to develop in socioeconomic transition, it has become the backbone of industrialisation (Vasudevan, 2003). IT is considered a tool in countries' economic growth, mostly by competition enhancement and significant effects on productivity when used widespread (Olivera & Martins, 2011). Long-term economic development measurement is often accompanied by IT-enabling and access to technology at the workplace and market (Bowersox & Calantone, 1998; 1998; Stank et al, 1999). In today's global economy, IT has made big changes to the way businesses operate and succeed. To transform and develop, organisations must use IT to achieve tremendous advantages against their market competition. Moreover, the technology era is changing business environments by educating students on current developments (Turban, 2008). IT has gained an important role in everyday life by making our lives easier and provides us with more efficient and effective ways to do our work (Heeks, 2002; Schwalbe, 2015).

Technology has many roles in education, including team engagement, knowledge retention, collaboration, learning skills, and many ways to enhance industrialisation. The examination of the United States (US) economy based on technology from 1997–2000 had revealed resource growth. Its dominant explanation was the incorporation of detailed information for industries. The investment of IT in education growth created educated workers that enhanced the economy (Jorgensen & Stiroh, 2003 Literature also alludes to opposing views, such as too much IT in education limits the social interaction, reduces student self motivation, and causes destruction (O'Donoghue et al., 2004). Spelling and handwriting might become reasons for occupational therapy (Hawkridge et al., 2018). Mechanics have less focus and more difficulties in learning to read or interpret words and letters (Montgomery, 2017). Working with computers has been shown to have visual complications, brain and cardiovascular problems, which might lead to mortality (Kochina et al., 2006). Most research

disregards these disadvantages of IT and has consensus on education investment because growing economies and skill increase benefits. Research hinges on the assumptions of these strong reasons for IT usage to examine countries in development. For some countries, investment in IT benefits is a difficult process to measure (Gunasekaran et al., 2001). For postconflict countries, the various US practices dominate, which include investing in IT practices, especially in people with higher levels of education (Jorgenson et al., 2003; Milton, 2017).

In the United Kingdom, a call for debate was about stronger links between industry and education. In 2000, some education technology programs failed from lack of interest in science and technology research. However, initiatives have been introduced from the government for a new era education system (Grady & Pratt, 2000). As Jones pointed out, to remain sophisticated and competitive, states must invest in IT for long-term survival. The latest and future efforts are being made to manage information better and with ease (Jones, 2015).

RESEARCH BACKGROUND WITH RELATED WORK

IT in Postconflict Regions

Postconflict regions experience different challenges and issues in IT incorporation. Issues like management and technological performance (Aliu & Halili, 2013), low innovative competition (Akintoye et al., 2008), weak business cases (Rosacker, 2010), and at most a lack of computer literacy due to deficient educational programs (Berisha, 2009; Voetsch & Myer, 2005; Soini & Veseli, 2011). They are exceptional cases, with little research attention given to information systems. Research focuses on changes in such emergency situations paramount for economic stability.

In 2009, the United Nations declared postconflict regions as special cases. Kosovo has its own challenges in technology adoption and is lacking contributions to economic development and stabilisation (Stapleton, 2010). Postconflict regions are displayed in literature as a subgroup of developing countries, focused on disaster management (Mubareka et al., 2005), social studies (Sorenson, 1998), and peace studies (El-Bushra, 2007). The testimonials mostly point to damaged infrastructure, poor education, and low economic capacity.

There is also evidence of performance differences among entities, depending on ownership and funding. Public sectors are funded by the government through a common-ownership concept (Bozeman, 1987). This has been known to have less efficiency, investment, and performance (Boyne, 2002). Private sector organisations are funded by individuals to make a profit (Akintoye et al., 2008), with higher rewards for superior performance (Boyne, 2002). IT investment in the public sector has been left with reduced budgets and flexibility in employment conditions (Crawford & Helm, 2009). On the other hand, the private sector has slight movement (Marasovic & Lutz, 2015), but in general, it is below average when it comes to technology and information (Soini & Veseli, 2011).

Earnest (2015) examined many of the cases and found issues in multiple Kosovo's project implementations, such as a lack of proper processes and procedures for the use of technology tools, which has been noted as a cause for nondevelopment. The public game-health project case was attempted by the Ministry of Development, but it ceased to exist due to technological problems, lack of skills, and poor infrastructure (Judd & Issakov, 2008). Martin-Shields & Bodanac (2018) highlighted strong arguments on the importance of IT usage in economic development assistance. Not much has changed recently in comparison to previous years in Kosovo. The authors argued that even for peacekeeping's presence and use, ICT could support economic development.

Low Productivity and Missing IT Skills, Literature Cases

A large number of studies have highlighted the missing IT skills and the effects associated with it in the development of Kosovo. The public game-health industry case was a project attempted by the Ministry of Health, but it was substandardly managed in terms of technology use (Judd &

Issakov, 2008). A public example of Tempus education presented an IT pilot project as an attempted technological investment, but they never reached any prosperous output (Gavrilovski et al., 2012). The private Rochester Institute of Technology (RIT) attempted to implement online courses in a Polycom education project, but it did not succeed due to students' insufficient skills in technology (Marasovic & Lutz, 2015). So even in private sectors, many strive for more technology availability despite disadvantages in human knowledge. IPKO, an internet company, was set to assist the education system, but it failed due to a lack of infrastructure and students with IT skills (Stone et al., 2004; Ahmeti et al., 2012). Telemedicine development, Telemedicine Center of Kosova (TCK), has offered e-health options after the war, only to be left as a concept (Latifi et al., 2006). A similar such fate has been met even in the manufacturing industry. All development was service based, without any focus on IT development benefits (Aliu & Halili, 2013).

Small- and medium-sized enterprises (SMEs) mainly are concerned with performance and development, thus, they focus on IT and its innovative changes (Berisha, 2009). SME hardly use computers for financial reporting, due to poor department IT-skilled staff (Soini & Veseli, 2011). Those best skilled in IT are in the banking industry in Kosovo, with an elite status of economic performance. Their recipe for success is the outsourcing services of up-to-date technology pertaining to the central bank in Kosovo.

The UNESCO team strived to find solutions for the last 5 years. They foresee education as an important priority component for sustainable development (ESD). The best way to approach the situation is through critical reflection, knowledge submission, and capacity building (Hyseni Spahiu et al., 2014).

Additional work reveals a large gap among rhetoric, policies, and practices in schools (UNESCO, 2009). Therefore, it is apparent that Kosovo has proceeded through the first two decades of postconflict without proper technology adoption and with a system that does not provide contributions to education. Certainly, the absence of effort or evaluated programs from the learner's perspective is a commentary measurement for technology and teaching offerings that reflects in necessary assessment requirements.

Research Objectives

The present study focusses on the availability, level of investment, and use of IT in Kosovo. The main objectives of the study include:

- Identifying the digitalisation level and computer use.
- Quantifying the computer knowledge deficiencies among industry cases examined.
- Examining the investment level in IT for knowledge and practice.
- Examining the measure of IT investment among public and private sector.

Research Questions and Hypotheses

The paper explores the following research questions:

- What is the extent of digitalisation in the workplace system in Kosovo?
- Is the computer availability sufficient for new generation work performance in the country?
- Is the information technology use sufficient for the productivity and performance?
- How much is the IT investment level in the different industries?
- Does the investment level differentiate among public and private sectors?

Postconflict countries with low economic development lack available resources, knowledge, and practice of IT in their education systems. The examination tests the following hypotheses:

Hypothesis one: Most companies in Kosovo are not equipped with sufficient digitalised technology in order to perform prominently in productivity and performance.

Hypothesis two: The country did not invest in youth education competence for higher knowledge in the information technology field, especially in the public sector.

Hypothesis three: Work environments show poor results in IT with minimal tools used compared to the level of maximum use possible, with slightly better results in the private sector.

Role of Education in Kosovo

Education is the main pillar and challenge to humanity and society, also the key factor to support it. Fullan (1999, p. 1) theorised the need for change at all times through education is highly vital at every step we take. Education change is a powerful force for peace and a recovery factor (Hilker, 2011; Michael, 2001).

Until 1999, formal education in Kosovo was similar to western European countries. A system with a 3-tier architecture consisting of primary for 8 years, secondary with 4, and tertiary depending on degree (Bartlet, Power & Blatch, 2004 in Bicaj & Berisha, 2013). Immediately after the war, an important statement based on facts for the road to development mentioned that, 'changes in the education system in Kosovo need radical reform' (Fullan, 1999).

In postconflict regions, issues within education typically result from shortages of knowledge in technology and finance (Ihesiene, 2014), skills, tools and techniques (Krasniqi, 2016), and lack of computer literacy (Berisha, 2009; Soini & Veseli, 2011). Concerns raised by Fullan (1999) for the education system overlook IT as an essential tool for economic and productivity growth. In postconflict countries, every part of the economy is controlled by the state, including education. Though the matter was identified as highly important with less arguments, the system shows minimal progress.

Education in Kosovo, even with extreme burdens, was also affected by politicians working directly for their interests (Rexhaj, 2011, p. 6; Rexhaj & Pupovci, 2015). It was unclear why the era of new technology is not changing businesses through hiring educated students. However, a fundamental fact is clear, the education system requires fundamental improvement to enter the European Union (EU). After late fundamental standardised reforms and teacher training from the EU, the education system began to witness some upgrades (Bicaj, 2011, pp. 29–35).

Tahirsyzaj (2010) argued that time is needed for making essential changes to deliver competent and skilled students for the economy. This paper argues about the fundamental reforms that have to be incorporated to bring about changes in introducing IT in educational curriculum. These changes include training teachers to perform IT-based education all over the country. Previous programs did not involve students' position and did not put students in the driver's seat, which was the main reason for the lack of improvement of the situation. Students practically did not gain IT knowledge and practice it. The challenging situations continued with poor economic development, with no fruitful education to resolve problems. As a result, the public sector lies at the bottom level of investment priorities, with slight figurative movements in the private sector.

Technology Adaptation and Evaluation in the Education System

IT advantages and knowledge enable competitors to have an easier entrance to existing markets, as business environments remain competitive at all times. Skills and knowledge are variables worth knowing and keeping on trend, especially for regions on the road to development. To carry on, it is vital to understand the importance of technology adoption gain, for future generations and economic development, as well as sustainability and security of the country.

Secondly, research robustly implies that there is an insufficient level of IT availability for practice in Kosovo education. Assumptions derived from literature mentioned the economic situation, weak performance, and development as main factors contributing the same. In theory, the importance of use is vital as proposed by Davis et al. (1989, p. 985), who said that 'the perceived usefulness of

technology is a main contributor to its use'. 'The prospective users', where the probability of a subject using an application system will increase job performance, and its only gained in higher education. The research acknowledges the importance of IT usefulness as the main factor for the postconflict regions in desperate need for development (Anderlini & EL-Bushra, 2007). The research alludes to the importance of measures to be taken and voice of implementation that can be imposed upon. Jorgenson et al. (2003) argue that perceiving the usefulness of investment in IT is important for the economy and individual industries, when the knowledge is acquired from high school. However, authors diminished the importance of practicing technology in school for higher competence.

Literature contains many perspective theories on technology adoption. One focuses on on adoption forms of technology and benefits, another on body adoption of operators. Hence, Galor and Tsiddon (1997) empirically examined the interaction among technological progress, earnings, and economic growth. They inaugurated the theory on individual earning increase with ability, positive effect on individuals, thus, education is positively correlated with ability. Besides human adoption depending on technological progress and advanced sectors, it also increases leverage when upgrading technology (Galor & Tsiddon, 1997). The research calls for empirical evidence of technological availability and practice as an absent factor of economic growth. The results are deduced on individual skills increase when education is correlated with the application technology. Examples of technology acceptance models in developing countries are also demonstrated in Gupta & Dasgupta research (2008) research.

Stapleton (2010) argues that, to effectively adopt technology, knowledge is required; in terms of control system and operation-necessity, human skill is required. Postconflict countries need assistance with security and development, backed through system control. Studies show that knowledge of technology integration into processes remains a key factor for adopting IT successfully (Samolineko, 2008), a solid reason of importance for postconflict countries to explore the technology and its adoption probability within the education system.

Evaluation of Education System in Postconflict Regions

One examination of technological adoption in Kosovo as a postconflict country was done in 2011 by Stapleton. Findings showed that the Kosovo experience did not align with the theories on nonconflict developed countries, referring for further investigation in emerging technology in education (Stapleton, 2010, 2011). Stapleton and Limani did research in 2018, where they observed inexperienced individuals and low IT implementation along with previous theories that have been proposed. Human factor issues scored low from lack of knowledge and education-certified programs. However, Limani and Stapleton (2018) pointed out the importance that awareness of business and the need for digitalisation concerns has increased.

Ultimately, the research infers many challenges in technological knowledge and implementation in postconflict countries.

METHODS

With the exception of minimal literature to examine, research is based on Miller's model of the processing elements of a student retrieving information that is focused on their responses for analysis to reach a conclusion of the level of IT availability in the chosen category (Miller, 2004). An empirical approach in data collection and analysis will be taken using surveys based on evidence the literature provides (Hall & Ziedonis, 2001). The research will be a hypothesis test based on the model of Giorgio (1997). Digitalisation, IT use, and investment are the units of analysis, which are assumed to be insufficient in postconflict countries. This research intends to determine that lack of skills and education play a vital role in substandard economic development.

Low cases of performance in literature are the subjective figures observed by some researchers. Campbell (2014) stated that 'preliminary information is a strong base for qualitative work, but a need for quantitative research is vital'. What is the extent of utilisation of computers by working students?

Does the workforce use computers? If so, to what extent do they use them for knowledge gain needs to be understood? Quantitative data collection is considered to be the best approach for testing the IT use, proposed by the objectivity of literature captured through variable measurement (Yoshikawaa et al., 2008; Cresswell, 2013; Beqiri, 2010). Only direct information from literature, documents, and measures will find the result needed.

Clusters with issues that impact everyday life in Kosovo include health, education, industry, and more. Many have inherited concerns with computer literacy and efficiency, education is the core interest for the new generation. Individuals belonging to the examination group are companies and categories that have been observed. For the sake of noble reality, case studies have been chosen to answer the literature survey. The country is well known for strong autocracy, as Bicaj & Berisha (2013) argued, the research assumes that authorities seek to minimise problems, or not respond, so literature is the answer for preliminary problem analysis.

To examine and analyse research questions, collective evidence is needed. Sharp's model requires sequence theory. A low use and knowledge of IT is a problem of poor countries, which requires further study (Sharp et al., 2002). One time information extraction from the literature survey is designed to collect data from case examinations. Postconflict countries are known as low context culture, so people are less time appointed, mostly spontaneous individuals (Mc Garry et al., 2010), making it hard to extract information from them. For the preliminary problem identification, the sequence literature examination is assumed to be appropriate.

Work Plan

The literature survey examination collects findings from case study information extraction. The is from examinations of companies observed from a literature review, with information from computerised and noncomputerised data. The information examinations from the same sources are based on categories of: public and private and IT or non-IT investment. The information is also ranked based on the transformation information of low, medium, and high, for the level of availability of technology knowledge and use.

The collection of literature information findings will be documented in a tabular format similar to BAT table model (Fink, 2002). The research plan is to generate numeric data measurements, as seen in Hall and Ziedonis (2001). The genuine method of hypothesis explanation is shown in Kleinrock's (1976) publication, and chi-square statistical analysis of differences among levels used as described in literature (Schefe, 1947). Accuracy derives from precise measurements, and from information in the field, that will achieve direct data collection advantage.

The Population and Participants

The to be examined is a member of a special category of developing postconflict countries, in this case, Kosovo. The analysis units are companies observed from a literature review of case performances in postconflict countries. Categories analysed are public and private sectors. Main finding of interest to be extracted is the level of IT and non-IT investment and use.

The key reason for a literature review survey to find information is the hypothesis undermines technology use in the workplace and industry, which increases assumption of deficiencies in technology education availability.

The computerised level is measured with independent variables for computerised (CO) and noncomputerised (NCO) groups with Yes or No measurement.

The investment level is measured with the dependent variables for information technology investment (IT-IN) or noninvestment (NIT-IN) by belonging or not to the category of public sector (PU) or private sector (PR).

The expected variables to affect the outcome are: level of digitalisation with elements of computerized level (CO) or noncomputerized (NCO), IT investment with (IT-IN) and (NIT-IN), and public (PU) and private sector (PR), model of (Lacker & Rusticious, 2010; Frels & Onwegbuzie, 2013).

Ethical Consideration

This research is a preliminary research work, with further detailed research to be conducted in the school field. As such, it is a literature review information extraction work-based product.

According to data protection laws, the anonymity of the participants is essential for ethical research to be conducted (Kaye et al., 2015; Tene & Polonetsky, 2012). The information collection derives from literature analysis and data extraction. In the continuous research planned to be done in schools, by random students responding voluntarily and anonymously, consent from schools and parents for students under 16 years old is necessary. An ethical approval from the university and committee will be obtained. Information extracted for the research is purely for its examination, there is no expectation for it to be spread for any service provided by this work.

Instrumentation

Data collection will derive from a literature review case study-based extraction that corresponds to the work examined. The qualitative information, transformed into numerical data measures, is the input for the instruments for observation and documentation, based on numerical description outcome developments (Yilmas, 2013). The data refining process involves the extracting measures from scores of 1 for yes and 0 for no, counting the sum to the maximum number for highest statistical analysis (Berry & Linoff, 1997; Shor, 1994).

Variables and Their Interpretation

Variables employed procured from research and measured components that are not dependent on others, which affects the outcome. It is expected to extract the variable correlations of one-time measurement on production calculation (Frels & Onwegbuzie, 2013).

Independent variables:

- Computerized (CO)
- Noncomputerized (NCO)

Mediating variables:

- Information technology investment level (IT-IN)
- No information technology investment level (NIT-IN)

Dependent variables:

- Public (PU)
- Private (PR)

Hypothesis one addresses low productivity and performances from companies examined in the literature by the scale of technology and digitalisation availability.

Hypothesis two explores the investments in the information technology field for youth higher knowledge, education, and competence, especially in public sector.

Hypothesis three explores the link to: good production, supporting the existence of technological knowledge and competence, and the difference among sectors.

Codebook for Numeric Scores

The following codes to be applied in the data analysis:

- CO – computerized, NCO – noncomputerized. Yes or No selection.
- ITU – information technology tools use level, numeric score from 1–5, measures starting count from 1 to MAX-ITU.
- MAX-ITU – maximum information technology tools used.
- IT-IN – information technology investment, NIT-IN – no information technology investment. Numeric score selection of: 1 for belonging and 0 for nonbelonging.
- PU – public sector, PR – private sector, measures starting count from 1 to MAX CO.
- MAX CO – maximum computer use.

Data Collection

From the literature's examination of the concepts of low productivity and economic performance in relation to missing knowledge and skills in IT, the first set of data includes units of analysis for the research. Table 1 shows the examination of computer availability for the cases found in it.

Table 1. Computerize availability levels-quantity cases from literature

	Companies observed from Literature Review	Computerized	Non computerized
1	GAME- health project-private		Yes
2	Tempus project-public	Yes	
3	US- Organization WHO project - private	Yes	
4	RIT technology UNI Swen Project-private	Yes	
5	IPKO- "Web com" project-private	Yes	
6	Kosovo "Planning"-private	Yes	
7	SME-IT survey-private	Yes	
8	CBK-review-public	Yes	
9	TCK-IT project-public	Yes	
10	Manufact-ICT-private		Yes

Second, Table 2 illustrates the units of analysis and their investment level for the corresponding component.

Table 2. Investment levels- quantity cases from literature

Companies observed from Literature Review	Category	Investment
GAME- health project	Private	IT
Tempus project	Public	IT
US- Organization WHO project	Private	IT
RIT technology UNI Swen Project	Private	IT
IPKO- "Web com" project	Private	IT
Kosovo "Planning"	Private	Non-IT
SME-IT survey	Private	IT
CBK-review	Public	IT
TCK-IT project	Public	Non-IT
Manufact-ICT	Private	Non-IT

Further analysis has imposed the classification of the descriptive features into categories model (Flora & Curran, 2004).

The order of categories include poor, low, average, high level, excellent, lack of, and more. The data are transformed into an ordinal group from low to high and from worst to best. We use the model of Earn Value Technique (EVM), done through code extraction text notes, used for categories and themes (Sulaiman et al., 2006). Table 3 contains the documented code data extracted. Information is preprocessed to be suitable for quantitative analysis.

Table 3. Ordinal data transformation collection-observations from literature

	Categories observed for Investment and IT level of development	Level of IT tools used – Notes and Codes
1	GAME- health project	Low -low level
2	Tempus project	Low –low level
3	US- Organization WHO project	Medium-moderate
4	RIT technology UNI Swen Project	Low -low
5	IPKO- "Web com" project	Medium-intermediate
6	Kosovo "Planning"	Low – lack of
7	SME-IT survey	Low –low
8	CBK-review	High –excellent performance
9	TCK-IT project	Low –low
10	Manufact-ICT	Low–no use

EXAMINATION AND ANALYSIS

First examination report is data exploration on standard IT level. From a total MAX CO – maximum computer use, NCO – no computer use.

Table 4. Scores for computerized standard level- number of case collections from literature

	Literature cases for IT level standard	Computerized	Non computerized
1-10	Cases	8	2

The second examination report discusses the data collection on category level and its investment belonging. The scores are presented in Table 5. IT-IN- investment in IT, NIT-IN – no investment in IT, PU – public sector belonging, PR – private sector belonging.

Table 5. Scores for investment level- literature case collection

	Public	Private	Total
IT	2	5	7
Non-IT	1	2	3
Total	3	7	

In the third examination report, we study the use of IT tools in the examination cases in the literature analysis. The descriptive information of low–high is converted into numbers (1–5) for comparison, with the best situation represented by 5. Table 6 presents the scores of IT tools use level in companies and the levels necessary.

Table 6. IT use out of best possible scenario-literature case examinations

	Categories observed for Investment and IT level of development	Level of IT tools used transformed into numbers	Max possible use
1	GAME- health project	1	5
2	Tempus project	1	5
3	US- Organization WHO project	3	5
4	RIT technology UNI Swen Project	2	5
5	IPKO- "Web com" project	3	5
6	Kosovo "Planning"	1	5
7	SME-IT survey	1	5
8	CBK-review	5	5
9	TCK-IT project	1	5
10	Manufact-ICT	0	5
	Total	18	50

Total companies = 10, MAX-ITU = 50, ITU = 18

MAX-ITU – maximum possible use of IT

ITU – level of IT use

RESULTS

The research examines the progress in different organisations as an assumption of missing digitalisation in the education systems in postconflict countries. The minimal economic development is pursued mostly from lack of knowledge and experience on technology assumed to be caused by a poor education system.

First Examination

The digitalisation of computer levels shows a promising picture as, for most of the cases, people have access to computers. The maximum mathematical expression for highest availability possible from the observed measurements, or lowest as minimum, serves as measured units for the best outcome (Putnam, 1998). Total cases analysed was 10, numerical collection from total cases analysed is summarised in Table 3.

The research uses the percentage of the measured cases divided by the total, multiplied by 100 (Tukey, 1957). The percentage of maximum computer use divided by total times 100 is $8 / 10 \times 100$, or 8. So, MAXCU = 80%, and the minimum is 20% of the total, taken from the maximum (Wade, 2005). The count is total number of participants, which is 8 in the first examination (Berry & Linoff, 1997). The sum is the addition of the participants to examine, or $8 + 2 = 10$ (Shor, 1994). The average is the sum divided by count, $10 / 2 = 5$ (Kleinrock, 1976). The result of average computer use is AVGU = 5.

From the analysis, computer use is equal to 8, which is higher than the average use of 5, COU > AVG. Chi-square analysis or Shewhart control chart is an observed distribution of data that fits the expectation. It is done mostly for the independent variables with no effects (Scheffe, 1974).

Figure 5 shows nonsignificant results between computer use and nonuse from the online application of Zamora et al. (2006). As assumed, this is the average computer availability in Kosovo.

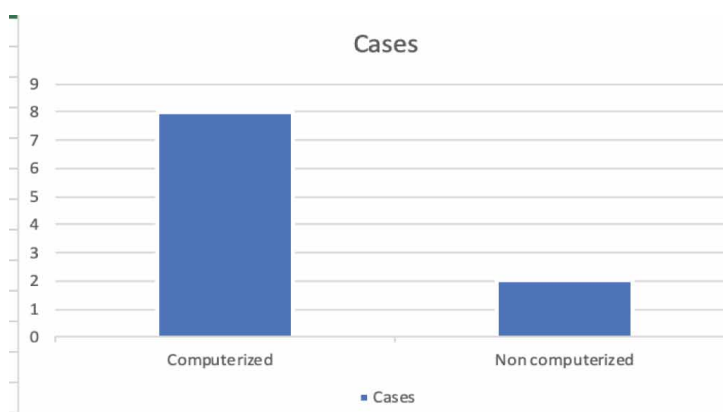
Figure 1. Chi square statistical analysis for computer-use level-> refers to Table 4

	COU	NOU	Marginal Row Totals
Public	1 (1.4) [0.11]	1 (0.6) [0.27]	2
Private	6 (5.6) [0.03]	2 (2.4) [0.07]	8
Marginal Column Totals	7	3	10 (Grand Total)

The chi-square statistic is 0.4762. The p-value is .490153. Not significant at $p < .05$.

Figure 1 shows the computer availability to most of the cases examined in the literature through Microsoft Excel Software (Version XX). It shows 80% availability and 20% nonavailability. Statistical analysis expresses the comparison of the cases observed in the literature, if the people have computers available in their work environment. Clearly, most of the people did have computers available, which accounts for the computerised environments.

Figure 2. Computer availability statistical analysis -> visualization from Table 4



Second Examination

The second examination explores differences in investment levels. As the research assumes, there is a minimal level of investment in IT, especially in the public sector, where the majority of knowledge and skills are derived. The total number of cases analysed was 10, and the numerical collection from the analysis of the total cases is shown in Table 4. The IT-IN = 7 (numerical collection for IT investment), NIT-IN = 3 (for non-IT investment), PU = 3 (for the public sector), and PR = 7 (for private sector). The percentage of the IT investment in the private sector is IT-IN out of PR times 100: $5 / 7 \times 100 = 71\%$. The percentage of the IT investment in the public sector is NIT-IN out of PU times 100: $2 / 7 \times 100 = 28\%$. The Count is the total of number of participants in the second examination: $7, 3, 3, 7 = 1 + 1 + 1 + 1 = 4$. The sum is the addition of the participants to examine in the second examination: $7 + 3 + 3 + 7 = 20$. The average is the sum divided by count: $20 / 4 = 5$.

From the analysis, the IT investment in the private sector is 7, which is higher than the average of 5, IT-IN PR > AVG. On the other hand, noninvestment in IT is higher in the public sector than in the private one, 2 versus 1. The results show nonsignificant results between IT investment and non-IT investment in the public and private sectors (Figure 3).

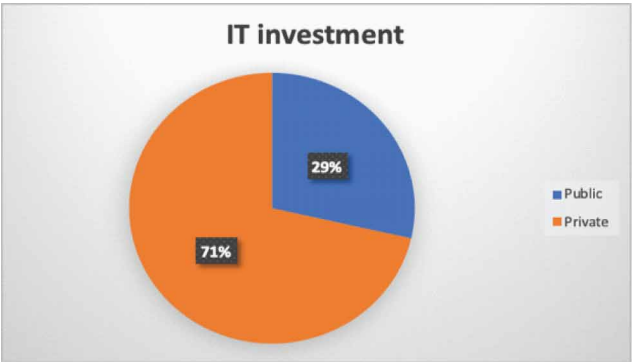
Figure 3. Chi-square statistical analysis for IT investment level-> refers to Table 5

	IT-IN	NIT-IN	Marginal Row Totals
Public	2 (2.1) [0]	1 (0.9) [0.01]	3
Private	5 (4.9) [0]	2 (2.1) [0]	7
Marginal Column Totals	7	3	10 (Grand Total)

The chi-square statistic is 0.0227. The p -value is .880303. Not significant at $p < .05$.

Figure 4 shows public and private IT investment in the production space in Kosovo. The comparisons between the public and private sectors' investment in IT and digitisation indicate major differences. The public sector is at a minimum level, but the private sector has made some progress.

Figure 4. The differences of IT investment among public and private sector-> visualisation from Table 5



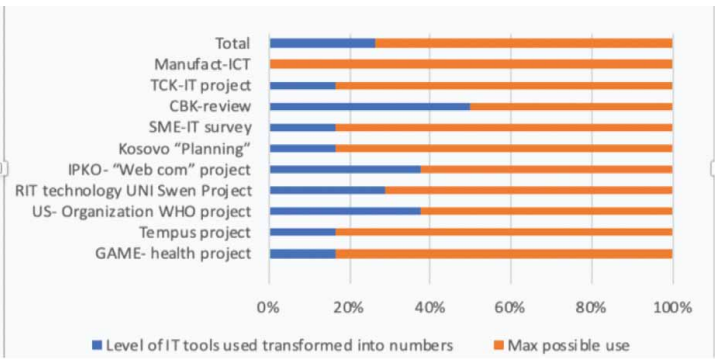
Third Examination

The third examination addresses the observation ability of using IT tools in production spaces. The ranking of low to high was converted to 0–5, where 0 represents no use and 5 high use. The total number of companies was 10, and the numerical collection from total cases analysed is shown in Table 6.

The MAX-ITU = 50 (numerical score collection for maximum possible IT use 1–5); ITU = 18 (numerical collection of use level of IT at current observation); ITU-PR = 16 (numerical collection for use level in the private sector); ITU-PU = 2 (numerical collection for use level in the public sector). The maximum possible use is calculated as 50 from a total of 10 cases examined of rank 1–5, and the level used shows a number of 18. The percentage of IT use is $18 / 50 \times 100 = 36\%$; the count is the total number of participants: 18, 50, 16, 2 = 4; the sum is the addition of the number of participants to examine: $18 + 50 + 16 + 2 = 86$; and the average is the sum divided by the count: $86 / 4 = 21.5$. The use in percentage is 36%. The average use is even below 21.5%. This statistic is assumed from the issues of technological performance, low innovation, and low economic capacity, all of which stem from poor education, as drawn from the literature.

Figure 5 shows the IT tools used in the work environment. The best case of CBK is about 50%, with more room for improvement. Meanwhile, the worst cases were in the manufacturing industry IT with nonuse as 0%, or a very poor use case. In general, the use stands are not higher than 30% for most cases.

Figure 5. Level of IT tools used out of maximum possible use -> refers to Table 6



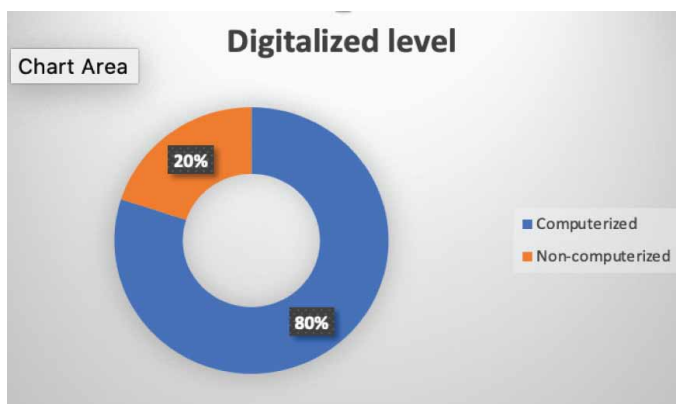
The IT use figures show poor results on IT availability and tools used. Most of the literature provides a description of missing IT resources. The companies with non-IT outcomes, and with nonskilled human resources in technology, were the main concerns needing revision in the postconflict regions and in Kosovo. These measures can shed light on the situation in education and provide a foundation for development of countries belonging to those categories.

Interpretation

The following hypothesis has been tested: Most of the companies in Kosovo are not equipped with sufficient digitalised technology to perform prominently in productivity and performance. The data above was collected and analysed to interpret the hypothesis as stated.

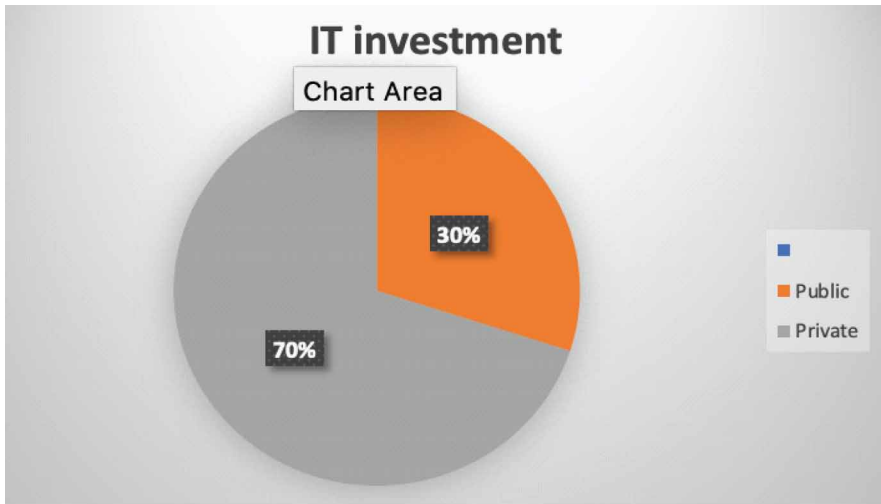
Most of the company cases examined in the literature did have computer availability. The ratio of digitalisation possession is 80% to 20% in favour of Yes. The first hypothesis does not hold, it has been refuted. Figure 6 shows the visuality of the data result collected in Table 1, through Yes or No marks, from computerised availability quantity-level literature cases.

Figure 6. Level of digitalization in companies



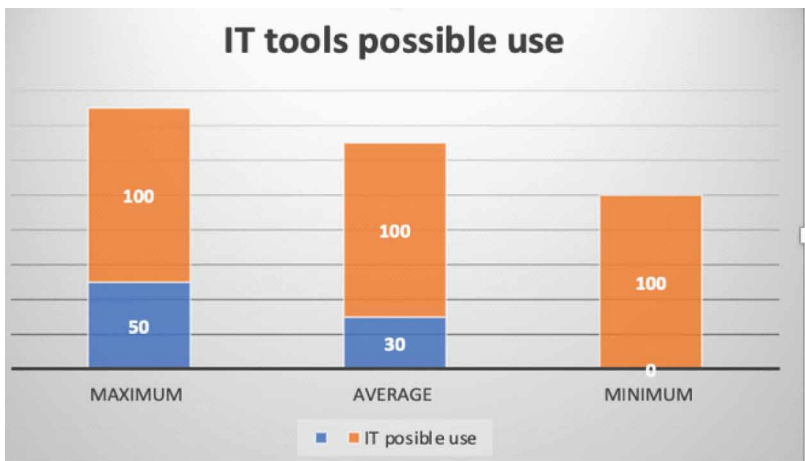
In response to the second hypothesis that the country did not invest in youth education competence, for higher knowledge in the information technology field, especially in the public sector, the hypothesis tests show: Most of the companies' cases examined were nominal on the information technology investment. In the private sector, the rate was higher with 71%, whereas in the public sector, the comparison scale was quite low at only 29%. The second hypothesis holds for minimal investment in information technology, specifically in the public sector, where the majority of education takes place. Figure 7 shows the visuality of the data result collected in Table 2 by belonging to the category and counting 1 for each.

Figure 7. IT investment level among sectors



Third hypothesis hypothesis states that work environments show poor results of IT with minimal tools used, compared to the level of maximum use possibility, with slightly more appealing results in the private sector. The findings show that IT tools used in companies show poor results. The best case scenario is halfway usage, at a maximum of about 50%, in the case study of the private banks. The worst case scenario was negative use of 0% in the manufacturing industry. The average use does not exceed 30%. The hypothesis is true, the IT tools use is minimal or absent, which is in relation to the performance desired. It is evident that in the best performance, results belong to the private sector cases. The link is in, more investment for voluminous productivity. Figure 8 shows the visuality of how much the tools are used in blue colour, and maximum possibility to be used in orange. It shows a huge gap of how much the possible technology can be used on work performance, if implemented.

Figure 8. IT tools use from maximum possible use



DISCUSSION

A survey of literature shows the need for research on IT usage in postconflict regions, as it is one of major bottlenecks related to development. The utilisation of IT in the work sector from poor education is lacking in the post conflict countries, which has become a main criterion that needs to be addressed. A detailed study based on existing literature shows that post conflict countries are less developed. There is minimal use of IT and investment in the IT field due to the differences existing among sectors. Countries are required to upgrade their technology and provide a proper framework for IT-based education from the high school stage. This is essential in terms of development and economic growth of the country.

The present study was aimed at understanding the extent of IT usage in work environments in Kosovo. The study was aimed based on the literature analysis, which showed that the digitalisation in workplaces in Kosovo is practically nonexistent. Studies have highlighted the lack of IT knowledge and skills along with a lack of investments in the IT field which have hampered the development of Kosovo. Based on the literature survey that has been done in this study, most of the people have access to computers but do not have the competence and knowledge to use them in the workplace. The investment for IT-based technologies in the public sector and the IT tools used was found to be low. The private sector shows a slight advantage figure in that matter. The use of IT was not more than 30% in any of the applications in Kosovo, and the manufacturing sector had little more ideas about IT. The study highlights the vital need for educational reforms to incorporate IT-based knowledge and practice in Kosovo schools for economic development of the country.

Ultimately, the research contributes to the empirical literature in order to highlight the significance of education for development. It is an important treasure for students, academic schooling, and the library. Almost all of this research, for universities, may be the first and most important in the referring category.

LIMITATIONS

The research limitations may include the generalisation in IT and the role of education for strong skills to be drawn from the literature survey. The work is limited to a single country, Kosovo. However, to overcome this problem might reduce the clarity for the case examined.

The literature contains information on some IT usage in particular cases, but it is insufficient and does not state whether education provides skills for higher IT development, and that is why this research is an effort to develop further information for the technological view of the examined category. The literature also does include thorough studies on IT and skill availability in postconflicted areas. It is expected to generate information to understand IT use in general, with further need of examination in education. Limitations of the variables used involve future measurements with less detailed explanatory outcomes, and with more valuable descriptions. Large gaps can be covered in such cases for technological importance on performance, productivity, and innovation. Future research has an infinite amount of vital information to discover.

CONCLUSION

When analysing countries according to their economy and development, the UN divided various countries into developed, developing, and those in transition. The countries in transition gravitate towards the category of postconflicted areas. The level of development creates diametrical differences in many factors within each state. The present research focuses on a transition case of a postconflicted country, Kosovo. It shows sufficient elements of low development and is in need for improvement. It shows that it is mostly affected by the low implementation of information technology as the main reason for the absence of skills in the population. It is assumed the education system has not

sufficiently applied computers in school at every level for students to gain the necessary knowledge and practice for work competence.

IT examination in the field is necessary. It is clear that the poor use of IT in the workplace and the lack of practice in the future education system is present. The paper is supported by the examination of work case studies in proportion to their technology access and use. People need to review how much they are exposed to IT availability in work competence. This should be done to see the degree of competence they may reach in the future.

Overall, country development is very important, especially for countries classified as postconflict nations. The path into the future is mostly through digitalisation since we are in a 21st-century market. This is a market that requires sufficient skills, competition, and innovation. To accomplish it, Kosovo must level its workforce with other European countries' standards in both work and education.

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