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Mechatronic principles in greenhouse automation

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Abstract

Significant climate and meteorological changes influence the quality and cultivation of vegetable culture in great to a large degree. However, protected areas of intensive farming provide great opportunities to improve production efficiency with relatively small investment. Thanks to the advancement of technology, the possibilities for improving the existing facilities become significant. With the integration of sensors and actuators, alongside microcontroller application, a mechatronic principle in management of the functions of the objects is achieved - the automatic regulation of growth parameters of the growing culture.

Key words: contemporary greenhouse, mechatronic systems, irrigation, ventilation, automatic regulation

1. Introduction

Climate changes make agricultural production more and more uncertain, and it is rightly questioned whether we will have secure and high yields in the future. There are more and more elemental disasters during the vegetation season, but also long periods of drought that have a significant impact on successful yields. Considering the above mentioned problems, there is a need that the production of certain breeding cultures takes place in a protected area, which should ensure all necessary conditions for active greenhouse production. (Figure 1). The mismatch of air and soil temperature in protected areas is one of the many reasons behind the arrearage of the growth and the development of breeding cultures [1]. Changes, in the development of breeding cultures, are most commonly encountered in the sudden change of temperature and light of the space (transition from lower to higher temperatures at high sunlight). That is when the leaves

of the breeding cultures start to wither because the plant cannot obtain enough water (due to the lower temperature of the soil, which leads to slower root activity). Similar changes appear also during the transit from a sunny to a cloudy day (common occurrence in autumn), when at a higher soil temperature the root of the plant intensively breathes, consuming photosynthesis products, so the plant perishes due to the lack of nutrition.

For all types of vegetables, at times of growth, flowering, forming and maturing of the fruits, there is a need that the temperature is 3-4°C higher than the optimal one. In the intensive cultivation of the culture, an abrupt increase and decrease in temperature is not favorable; the optimal condition is that the air temperature increases and decreases by 2-3 °C within one hour. When the air temperature is greater than or equal to 7 °C of the optimal, the plants stop developing, whereas the difference of about 14 °C completely stops the growth of plants. Night air, as well as cloudy day temperatures should be 3-5 °C lower than daytime temperatures or temperatures during sunny days. The soil temperature should be higher by 3 °C during day and, at night, lower than the air temperature. A good temperature ratio provides a favorable balance of photosynthesis and dissipation (accumulation and consumption of organic matter).



Figure 1. Greenhouse construction

At ventilation openings, it is recommended to install an anti-mesh net, which prevents insect entry into the greenhouse. Bumble bee and other pollinators must be timely enabled during flowering and plummetering. In this way, the use of mobile meshes and the possibility of their opening and closing in certain periods during the flowering of the culture ensures an intense residence of the pollinator.

2. Greenhouse irrigation

The soil can be considered as a reservoir in which the required amount of liquid is stored between two irrigation cycles. The soil humidity in the greenhouse has a great importance for the development of vegetable crops. Different breeding cultures require different percentages of soil humidity that enables them to optimally develop. An unfavorable percentage of humidity affects the plant growth itself, with too little or too much humidity leading to a dry or a truncated plant and ultimately brings the crop to ruin.

2.1 Mechatronic system of the greenhouse irrigation

The main task of the mechatronically controlled irrigation system is to bring the right amount of liquid at the right time and in the right place, in order to ensure proper growth of the growing culture. The greenhouse irrigation system has the task of supplying the required amount of liquid to the appropriate place via the distribution system and electromagnetic valves. Depending on the current state of the climatic conditions (the air and soil parameters in the greenhouse) the mechatronic irrigation system provides the necessary irrigation regime (day-night, warm/ hot days or summer/ autumn/ spring). The choice of regime in the irrigation system is carried out on the basis of the plant species being cultivated and the season of production.



Figure 2. Irrigation distribution system with electromagnets

Electromagnetic valves direct the required amount of liquid to the desired part of the irrigation system, using the capillary tubes to direct the flow to the desired location [4, 6]. Electromagnetic valves were used for the regulating of the flow and the amount of water, which, with the possibility of programmable time setting for their switch-on, can provide irrigation for all the regimes and planned crops (Figure 2).



Figure 3. Electromagnetic valve

The reason for dividing the distribution system is the existence of different humidity in the greenhouse itself. Due to the higher humidity in the rows closer to the lateral sides of the greenhouse and the need for more liquid in the middle rows, the irrigation system has been divided into segments (Figure 3).

We get clear knowledge of the amount of soil humidity by using the humidity sensor and by reading the soil humidity value 2-3 times between the irrigation cycles [3]. (Figure 4). With the values from the humidity sensor and experimental considerations, it can easily be argued that the soil surface segments closer to the lateral sides of the greenhouse contain higher humidity and there-

fore require less water for watering. The system obtains the current humidity of the soil from the humidity sensors that are placed in strategically specific locations (Figure 4).

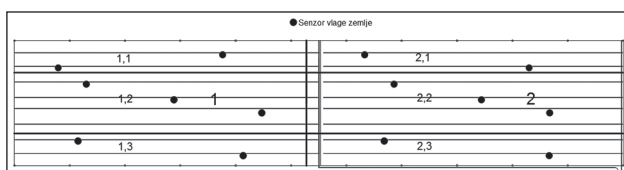


Figure 4. Layout of the soil humidity sensors in the greenhouse

On the already-installed irrigation systems such as a “drop-in-drop” system, the humidity sensor is placed near the plant at a depth of about 20-30 cm below the ground surface (Figure 5). If we want more detailed data on water consumption from the ground, the sensors can be set to two depth levels.



Figure 5. Soil humidity sensor with the module

3. Greenhouse ventilation

The main task of the ventilation system is to provide optimal conditions for the temperature and humidity of the air in the greenhouse. The optimum values of the temperature and humidity of the greenhouse can be adjusted to a certain extent by timely opening and closing of the side

of the greenhouse. In the current manual ventilation opening, it is never possible to timely determine the time when ventilation openings are to be opened or closed, which leads to extremely high temperatures that are a major disturbance to plant growth. By installing the sensors and actuators in the ventilation system, timely and gradual opening of ventilation openings can be achieved, thus preventing sudden temperature changes. However, it is also possible to achieve compulsive ventilation of the greenhouse with axially ventilators that blow the air in and out.

3.1 Mechatronic system of the greenhouse ventilation

In an automated object management system, priority over all data has the condition of the external wind speed, measured by an anemometer, whose value affects the opening and closing of the greenhouse sides (Figure 6). In the case of extremely bad weather it is programmed that, at certain high wind speeds, the sides of the greenhouse are automatically to be closed, because there is a possibility of damage to the plant as well as the possibility of raising or demolishing the greenhouse completely.



Figure 6. Anemometer

The needs of the greenhouse ventilation system, from the aspect of collecting data on the temperature and humidity of the air in the greenhouse, were satisfied with the application of two DHT22 sensors (Figure 7). The sensors are placed on two specific locations in the greenhouse, in order to better determine the mean value of the temperature and humidity in the air.

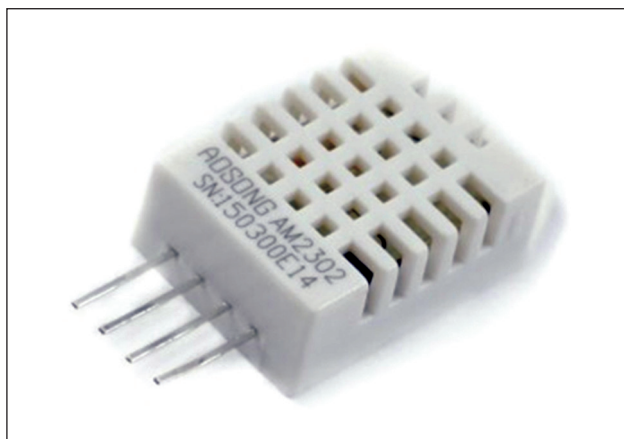


Figure 7. Relative humidity and air temperature sensor - DHT 22

The greenhouse ventilation system collects the data about the current temperature and humidity through the collected data is further processed in the microcontroller, and the mean value is determined. If the temperature and humidity of the greenhouse are in the unobtrusive area, the sides of the greenhouse are closed or opened depending on the need.



Figure 8. Position of the ventilation mechanism on the greenhouse

Direct acting (DC) motor is used as an actuator for timely opening and closing of the side panels. The engine is set on the existing side opening mechanism, whereas the locks are set to prevent the engine from coming out of the area where it is intended to move. The built-in DC motor is attached to the steel profile, while the output shaft of the gearbox is connected to the movable part of the greenhouse side [5]. The connection between the steel profile and the motor prevents the engine from rotating around its axis while lifting or lowering the moving side. The other side of the steel profile is

pulled into another steel profile that is attached to the ground and thus provides a stable support (Figure 8). When the relay is switched on, the motor starts to accelerate until the electromagnetic force and resistance force (force of the load) are offset and the engine is then turning at constant speed. Because the movement of the side section is limited to 80 cm distance, the limit switches are used as the travel limiter. When the mobile relay is switched on, it controls the lifting of the electric motor (and raising the greenhouse side), but when it is switched off, the engine is lowered to its limit position.

4. Mechatronic device integration

In order to operate the greenhouse automation system, it is necessary that Arduino microcontrollers, through the sensors, collect the data on the current humidity of the soil from individual segments of the greenhouse. For this automation concept, three Arduino microcontrollers have been assigned to collect soil humidity data from individual segments and send them the main microcontroller [7]. The greenhouse irrigation system works on the following principle: microcontrollers collect data from the soil humidity sensors in the entire greenhouse and calculate the mean values of soil moisture for individual subgroups of the sensors (Figure 9). After calculating the current humidity of the soil in the greenhouse, it is compared to the pre-programmed reference values and checked to see if turning on individual electromagnetic valves is required. By activating the electromagnetic valves, water is released into the required segment area and is programmed to remain turned on for 5 minutes, then switches to a 3-minute standby time, because the liquid requires some time to reach a certain depth in the soil.

Sensors in the greenhouse are connected to the Arduino platform via the I2C (Inter-Integrated Circuit), which represents the communication of peripheral devices with a microcontroller. The communication of the microcontroller was accomplished with the SPI four-wire connection of the serial synchronous data transmission. SPI achieves a two-way, duplex connection between one master device (master microcontroller) and one or more ancillary devices (slave microcontrollers) [2, 7]. Master device represents the device generating a

SLC tactile signal and it is a control signal. It addresses the attached “slave” devices for the purpose of downloading or transmitting the data, i.e., the master device generates a communication request for a given tact with certain “slaves” devices.

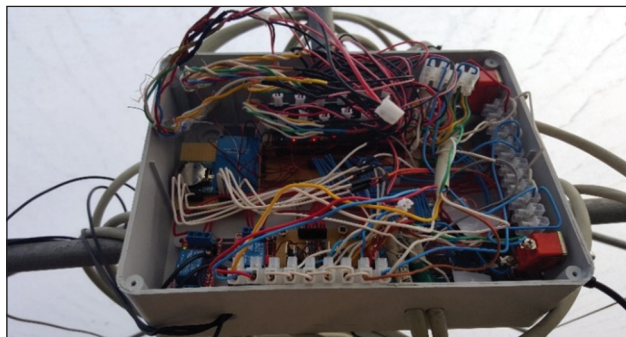


Figure 9. Microcontrollers and electronic components of the control system

After each reading of all sensors, the collected data is sent to the SD card where they are stored (Figure 10). The reason for the storage of data is to monitor the parameters of cultivation of certain cultures, which will enable the analysis of their influence on the improvement of the state of breeding culture. The external RTC module is an electronic device through which Arduino has access to accurate time (tracks time, records seconds, minutes, hours, days, months, and years).

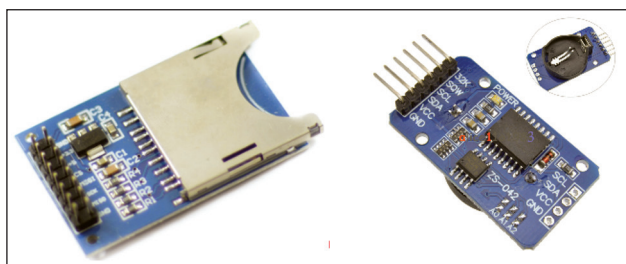


Figure 10. RTC- Real time clock

5. Conclusion

The mechatronic principle of the greenhouses automation reduces the dependence of production on outdoor meteorological conditions and ensures safer and better yields. An automated irrigation system using electromagnetic valves and soil moisture sensors ensures that the required amount of liquid is brought to a specific location and can also be used for growing breeding cultures. By installing mechatronic irrigation and ventilation sys-

tems in greenhouses, conditions for optimization of cultivation parameters are created, which ensures safe and profitable production. By ensuring optimum cultivation conditions in the protected area, they influence the intensity of growth, yield, the quality of breeding cultures and the choice of species that can be cultivated.

This mechatronic concept of greenhouse/ hot-house automation enables growing of vegetable crops throughout the year, and at the same time provides an intensive production form. By applying greenhouse automation, human work is directed towards process monitoring and parameter optimization with the ability to engage expert knowledge. With this automation concept and the installation of the security system (surveillance cameras, security cards), the greenhouse could serve for cultivating a currently prohibited plant in our country (marijuana). Of course, by applying the law for approving the cultivation of such herbs for medical purposes, the application of the mechatronic concept in greenhouse automation would gain its full significance.

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Investigating of the hazards and risks' knowledge in BiH

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Abstract

Hazards and disaster activities are inevitably associated with negative impacts and outcomes. In order to reduce their impacts, countries and societies firstly need to identify expected hazards/risks through risk assessment. If the country/society does not have a clear picture of the risks it may face, it is not possible to recognize, prevent or mitigate potential disasters in advance.

Many countries are using International Standards of Supreme Audit Institutions (ISSAIs) for performance measurement of their governmental agencies. In this article, researchers used the ISSAI 5510 – The audit of disaster risk reduction (DRR) in combination with statistical non-parametric tests (Kruskal-Wallis H, Mann-Whitney U Tests, Ordered logit regression and Spearman R correlation) to assess the hazards/risks knowledge within Protection and Rescue (P&R) Management in Bosnia and Herzegovina (BiH). The results of the data analysis revealed that there is difference between perceived and actual risk in BiH and there was a statistically significant difference of hazards/risks knowledge between different administrative levels of P&R system in BiH.

Key words: Hazards, risk, disaster, pre-disaster management, BiH.

1. Introduction

Depending on where we live, disasters are threats to both property and life. Over the last three decades across the world natural and technological disasters have been increasing in terms of frequency, size, number of people affected, and material damage caused [1]. Similarly, the frequency and impact of natural disasters in BiH has increased over the last few years, too. BiH faced severe weather – extreme

low temperatures and snow in 2012, floods in 2014, fires and landslides almost every year, etc. There are also some industrial hazards (leakages of untreated waste water from factories to the rivers, explosions, mining accidents, etc). Consequently, any of mentioned natural and technological disasters seriously disrupt the functioning of a specific community or society, including BiH.

With the elaborated growth of natural and other disasters, this area becomes a challenge for the institutions that are directly responsible for the protection and rescue (P&R), as well as private entities, non-governmental organizations, the academic community, and individuals. Many studies have indicated that pre-disaster management is highly cost-effective; a monetary unit invested in pre-disaster management can save several monetary units in post-disaster management; so, pre-disaster management has gained great importance. This is because that is a dynamic process that could ideally be developed and tested during normal times and activated and implemented before, during, and after the wake of unusual events.

The key issue that managers face in their organizations “is not whether a crisis/disaster will occur, but when and what type” [2]. Miththapala [3] emphasized that „policy and actions taken during prevention and mitigation have enormous and far reaching impacts on all states of post disaster management. All decisions and actions taken after a disaster will be justified based on pre-disaster actions/phases“. Similarly, INTOSAI believes that investment in pre-disaster management saves lives and mitigates suffering. It can be a significantly more efficient and effective use of resources than paying the bill for disaster response“ [4].

Therefore, this research will try to highlight the question of whether the protection and rescue au-

thorities at different administrative levels of government identified hazards/risks that might affect their area of responsibility in order to make more informed calculations of risk, upon which pre-disaster management actions are ultimately planned and taken to reduce possible negative effects to citizens, their property and environment in BiH.

2. Risk assessment in BiH

The identification of hazards and risks that may lead to disasters is the key factor that determines what preparative and preventive measures will be taken by the community and institutions of protection and rescue system in BiH. In other words, protection and rescue managers need to know their risks to manage them [5]. In this regard “most practitioners and academics refer to the term risk assessment as a process or methodology that can be used for evaluating risk” [6].

With respect to efficient protection and rescue management these activities and assessments require systematic research based on knowledge about possible hazards, risks, and vulnerabilities of community. Proper preparation of risk assessment allows protection and rescue management program elements to be based on realistic appraisal and provide justification for the commitment of program resources. Alike, risk assessment should provide useful and valuable information for the development of required operational and any other plans. Simply, these plans have to make predictions of what may happen in the future based on the past experiences and possible future scenarios and need to determine the possible maximum duration and extent of identified hazards.

Figure 1. shows that there is cyclical relationship between hazard, vulnerability and exposure of certain risk. Protection and rescue managers have to consider hazards, vulnerability and exposure elements once they develop capability for phases of pre-disaster management as early warning and prediction, prevention/mitigation and preparedness. At the same time, they should not forget that „the biggest problem in risk assessment is the common mistake of assuming that the hazard is the risk. The hazard in itself may not necessarily present a risk to community. It is a vulnerability of the organization to the hazard’s impact and

the probability of that hazard occurring that creates risk” [7]. Some authors believe that „risk is sometimes taken as synonymous with hazard but risk has the additional implication of the chance of a particular hazard actually occurring. Hazard is naturally occurring process while risk is actual exposure of something to a hazard“ [8].

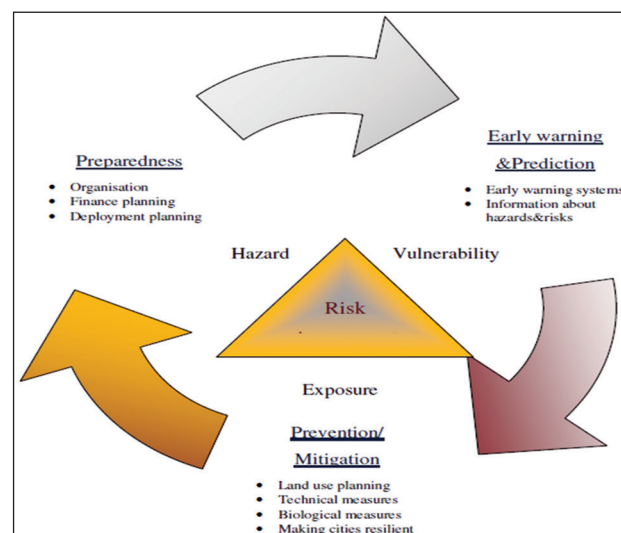


Figure 1. Risk assessment (INTOSAI, 2012)

Conventionally, risk is expressed by the notation $\text{risk} = \text{hazard} \times \text{vulnerability}$ ([9], [10] and [11]). Some other authors modified this equation as $\text{total risk} = \text{hazards} \times \text{elements at risk} \times \text{vulnerability}$ [12] and similarly, $\text{risk} = \text{hazard} \times \text{exposure} \times \text{vulnerability}$ or $\text{risk} = \text{probability} \times \text{consequence}$ [13] and [14]. Exposure analysis is essentially a (Geographic Information System (GIS)) analysis and involves spatial overlap of hazard footprints for the elements at risk (type, temporal variation, and quantification)” [15]. It can be concluded that “hazard (cause) - a potential threat to humans and their welfare, and risk (likely consequence) - the probability of a hazard occurring and creating loss [8]. Haddow et al. [6] believe that common essential elements to most of these methodologies of risk assessments are following elements: Identify and evaluate each hazard for the severity and frequency; Estimate the risk; Determine the potential societal and economic (direct and indirect) effects and costs; Determine the acceptable level of risk; and Identify risk-reduction opportunities.

Thus, risk assessment is a fundamental document that will be used for drawing up a Plan of protection and rescue from natural and other di-

sasters of institutions and bodies in BiH and the Development Program for the protection and rescue of institutions and authorities of BiH.

Bosnia and Herzegovina per the World Risk Index Report (WRIR) from 2017 by United Nations University Institute for the Environment and Human Security is classified in “4th group - urgent need for action” and keeping 93st place (WRI 6.31) out of 171 countries. The most important component of each country’s WRI score is “its exposure to natural hazards, referring to the percentage of population living within the reach of potential hazards such as floods, storms, earthquakes, tsunamis, droughts, and sea-level rise” [16]. The World Risk Index 2017 shows that BiH ranks below the world average. These statistics indicate that BiH institutions and society have to be constantly judged on their capabilities in order to develop and maintain efficient hazards/risk knowledge within protection and rescue management in BiH.

In accordance with article 13, item c) and d) of the Framework Law on protection and rescue of people and material goods from natural and other disasters [17], the Council of Ministers of BiH shall approve vulnerability assessment of BiH from natural or other disasters. In November 2009, the Council of Ministers developed a methodology for risk assessment [18] while the Federation of BiH (F BiH) developed its methodology in 2004 [19], and Republic of Srpska (RS) in 2011 [20]. Additionally, the Framework Law [17] defined that Ministry of Security of BiH is responsible for drafting a proposal of risk assessment of BiH.

Accordingly, the Ministry of Security of BiH, with help of responsible authorities (representatives) from state, entity, and Brcko district have prepared risk assessment of BiH which was approved by Council of Ministers of BiH in 2012. Risk assessment covers the whole area of BiH and considers *all-hazards approach, including natural and technological* disasters [21]. Originator of the risk assessment states that this document complied with the principles of the United Nations, as well as the recommendations of the European Union Risk Assessment (Global Risk Identification Program – GRIP, 2008), and the document of the European Commission - (Risk Assessment and Mapping Guidelines for Disaster Management, 2010). Actually, valid risk assessment of BiH of natural

and other disasters identified 24 main hazards (3 hazards with a high risk – earthquake, fires, and explosions; 11 hazards with an average risk; 5 with a low risk and 5 with a very low risk) that threaten BiH territory as it shown in table 1 [21].

Table 1. Hazards classification (Council of Ministers of BiH, 2012)

No.	Hazard	The degree of risk	Cross-border effect
1.	Earthquake	High	
2.	Fires	High	+
3.	Explosions	High	+
4.	Large floods	Average	
5.	Landslide	Average	
6.	The release of oil	Average	+
7.	Discharge of chemicals	Average	+
8.	Contamination of water	Average	+
9.	Interruption of electricity	Average	+
10.	Demolition of the dam	Average	+
11.	Landfills of hazardous materials	Average	+
12.	Discharges from industrial plants	Average	+
13.	Leachate from regional landfills	Average	+
14.	Emissions of harmful pollutants	Average	+
15.	Strong wind	Low	
16.	General strike	Low	
17.	Destruction of buildings	Low	
18.	Extreme temperatures	Low	+
19.	Interruption of the supply of gas, oil and heat	Low	+
20.	The attack on the IT system	Very Low	
21.	Vandalism	Very Low	
22.	The blockade of the supply of petroleum products	Very Low	+
23.	Loss of key staff	Very Low	
24.	Radiation	Very Low	+

Risk assessment considers scenarios for hazards with high and average risk of occurring or hazards that have an effect in the wider area of BiH with significant human, material and environmental consequences. Other hazards with low and very low risk which have a local character with minor consequences on human lives, property and the environment were not subject to detailed processing/

explanation. Similarly, BiH entities (F BiH and RS) and Brčko district developed their risk assessments.

Occurring hazards/disasters tell us that every country must engage in developing hazards/risks knowledge and other required personnel and technological resources to constantly monitor hazards/disasters in order to reduce their negative effects and allow prompt and efficient response.

3. Performance management and performance audit

Today, countries are doing different analysis/measurement in order to assess efficiency of different systems within government. Berman [22] stated that performance is about keeping public and non-profit organizations up-to-date, vibrant, and relevant to the society... and people want public and non-profit organizations to be effective and not wasteful. Therefore, “public administrations must, among other things ensure transparency and a growing stakeholders’ involvement” [23]. There are a significant number of countries that are using Performance auditing as young discipline from the accounting and auditing area to assess different governmental systems. The demands for public accountability of managers in public institutions is intensified so the interest for the performance audit increased. Performance audit examines the practice of management responsibilities, application of legislative in the institution, focusing on the weaknesses and failures in the management of the institution as well as promoting the overall organizational learning [24]. Since a significant number of countries are using International Standards of Supreme Audit Institutions (ISSAIs) for performance measurement of their governmental agencies so the researchers used ISSAI 5510 – The audit of disaster risk reduction as a great supportive tool for performance auditing/assessment a hazard/risk knowledge in BiH (More about performance measurement/auditing of pre-disaster management see in [25]).

4. Research findings and discussion

Focus of this article is therefore on assessing whether the hazard/risk knowledge is adequately incorporated at different administrative levels of government in BiH? For the purpose of answering

such a research question we have articulated starting assumption which states that: “Different administrative levels of government in BiH equally specified what types of hazards/disaster might affect their area of responsibility”. It means that all levels identified hazards for their region/area of responsibility. For the sake of establishing proper analytical framework ISSAI 5510 recommended 10 questions. Due to the fact that some questions are descriptive in nature researchers decided to use 7 of 10 questions from ISSAI 5510 and one specific question which is directly related to our elaborated hypothesis.

Accordingly, the researchers agreed with using survey with set of 8 statements to assess hazards/risks knowledge of P&R system in BiH.

Survey questions were formatted in the Likert scale (1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree). In terms of non-probability selected sampling the institutions/authorities for civil protection at state, entity, district, cantonal and municipal/city level were selected for participation in the survey. Table 2 shows that the 145 respondents, selected randomly or intentionally by their authorities, answered to the survey’s statements shown below. The main hypothesis is tested by using respondents’ answers to direct statement 1 while other statements, were used as an ordinal variable for descriptive statistics, correlation analysis and ordered logistic regression methods used for data analysis. This statements/hypothesis are:

1. The risk assessments on your level of governance clearly specify what types of hazards/disaster might affect your area of responsibility.
2. P&R institution at your level of governance has prepared risk assessment.
3. The institution (specific agency) who prepare risk assessments have been considering, among others, the following aspects: natural, human, indirect hazards, specific vulnerabilities, specific geographic locations and disaster management capacities.
4. The risk assessments are considered the probability of each identified type of hazard/disaster.
5. The Government (specific agency) is doing hazards research, which focuses on pre-disaster hazard vulnerability analysis and mitigation.

6. There are procedures for updating hazard maps and/or hazard/risk assessment.
7. There is information about the extent to which communities, structures, services and geographic areas are likely to be damaged or disrupted by the impact of a particular hazard.
8. The lessons learned about hazards of the recent major disasters have been identified and included in specific operation planes, etc.

Based on P&R professionals' responses researchers evaluated differences of incorporation hazard/risk knowledge between administrative levels of government by using Kruskal-Wallis H and Mann-Whitney U tests as follow. Table 2. shows the descriptive statistics based on respondents' degree of agreement with the statement that the risk assessments on their level of governance clearly specify what types of hazards/disaster might affect their area of responsibility.

Table 2. Descriptive statistics

Admin. level	N	Mean	Std. Dev	Std. Error
BiH	12	4,25	1,055	0,305
FBiH	10	4,10	0,994	0,314
RS	6	4,33	0,816	0,333
BD	4	2,75	1,258	0,629
Cantons	41	4,49	0,870	0,136
Municip	72	4,47	0,949	0,112
Total	45	4,38	0,972	0,081

Bearing in mind that the dependent variable is ordinal, during assessment of indication of responders' degree of elaborated statement, Kruskal-Wallis Test shown results presented in Table 3. Table 3. Kruskal Wallis H test – responders' degree of agreement to statement 1

Risk assessments	
Chi-Square	12,548
Df	5
Asymp. Sig.	0,028

a. Kruskal Wallis Test

b. Grouping Variable: Level of Governance

A Kruskal-Wallis H test showed that there was a statistically significant difference in the risk assessments about clearly specification what types of hazards/disasters might affect certain area of responsibility among six different levels of gov-

ernance, $\chi^2 (5) = 12.548$, $p = 0.028$, with a mean rank of risk assessment score of 4.25 for BiH, 4.10 for FBiH, 4.33 for RS, 2.75 for BD BiH, 4.49 for cantons and 4.47 for municipalities.

Once a Kruskal-Wallis H test showed significant difference between administrative levels of governance in BiH, the researchers used Man Whitney U test to determine paired levels of government where difference in hazards/risks knowledge exists. According to Man Whitney U test there are significant differences in attitudes 4 of 14 individual combinations of paired levels as it shown in the table 4.

Table 4. The results of assessment of hazards/risks knowledge

Administrative level of governance		Mann-Whitney U	Asymp. Sig. (2-tailed)
BiH	FBiH	52,500	0,592
	RS	35,500	0,959
	BD	8,000	0,041
	Cantons	219,000	0,500
	Municipalities	382,500	0,452
FBiH	BiH	52,500	0,592
	RS	26,500	0,683
	BD	7,000	0,056
	Cantons	151,000	0,140
	Municipalities	263,500	0,109
RS	BiH	35,500	0,959
	FBiH	26,500	0,683
	BD	3,000	0,046
	Cantons	104,000	0,476
	Municipalities	181,000	0,435
BD	BiH	8,000	0,041
	FBiH	7,000	0,056
	RS	3,000	0,046
	Cantons	16,000	0,003
	Municipalities	28,500	0,002
Cantons	BiH	219,000	0,500
	FBiH	151,000	0,140
	RS	104,000	0,476
	BD	16,000	0,003
	Municipalities	1467,500	0,951
Municip	BiH	382,500	0,452
	FBiH	263,500	0,109
	RS	181,000	0,435
	BD	28,500	0,002
	Cantons	1467,500	0,951

It is obvious that Mann Whitney U test showed significant differences between the Brcko District and all other levels of government, except the Federation of BiH. However, the test value of 0.056 between Brcko district and F BiH represents the asymptotic value of insignificance. In other words, this test was very close to show a significant difference ($p = 0.05$). All other links show a fairly strong relationship between answers on the given statement between all administrative levels of government. Next lowest value of the test is 0.109 (relation F BiH-municipalities). It is sufficient to reject the previously tested hypothesis: "Different administrative levels of government in BiH equally specified what types of hazards/disaster might affect their area of responsibility". The same conclusion can be carried out even if we look at only descriptive statistics' answers on this question, without going into deeper analysis, since the average value of respondents from Brcko district is significantly below the average value of answers of other responders.

The researchers also used Spearman R correlation to determine the relationship between two ordinal variables (statement 1: focused on hypothesis and statements from 2 to 8 as supportive statements for testing elaborated hypothesis). In order to interpret the correlation results researchers considered that values less than 0.25 have weak relationship; r values $0.25 \leq r \leq 0.50$ moderate relationship; $r > 0.5$ strong relationship; and $r = 1/-1$ perfect positive/negative relationship [26].

Table 5. Spearman R Correlation –
($N=145$ participants)

S1						
S2	S3	S4	S5	S6	S7	S8
0,55**	0,61**	0,47**	0,35**	0,26**	0,21*	0,23**

Legend:

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

S: Statement

The Spearman's analysis of the results showed that the portion of strong and moderate correlation is 72%, which improves relationships. There are no negative correlation between relationship values of the two actual variables. The strongest correlation was between statement 3 and statement 1 (0.61). Statements related to the extent to which

communities, structures, services and geographic areas are likely to be damaged and that the lessons learned about hazards of the recent major disasters have been identified and included in specific operation planes have shown weak relationship.

If results of correlation analysis are compared with the results of Ordered logit regression we can see that Ordered logit regression has also confirmed strong causality between statement 1 and statement 3 (The institution/specific agency who prepare risk assessments taking into account, among others, the following aspects: natural, human, indirect hazards, specific vulnerabilities, specific geographic locations and disaster management capacities). This means that respondents believed that development of statement 3 directly results increase of 4,4 times to the achievement of hypothesis 1. This percentage impact between statements 3 and hypothesis (statement 1) obtained by calculating the exponential value of the estimate value for the specific statement that showed statistical significance in this research. The relationship between statement 1 and 2 showed strong correlation but causality is not confirmed by ordered logit regression. The explanation of this result is fact that correlation value of 0.55 between statements 1 and 2 is very close to 0.50 as marginal value between moderate and strong correlation. Also, it was visible that results of Spearman R correlation and ordered logit regression showed that there is no statistical significant relationship between other statements (from 2 to 8) and statement 1, which is additional confirmation of agreement between those two statistical methods.

Anyway, research showed that there is the difference between perceived and actual risk in BiH. Beyond survey research findings, it is important to suggest that the valid risk assessment of BiH has not perceived heavy snow and extreme temperatures as high or average risk. Contrary, it classified extreme temperatures as low risk. In 2012, BiH faced low temperatures and record in the amount of snow (dumping two meters of snow) which isolated more than 100 villages and some cities in central part of BiH while a state of emergency was declared in the capital of Sarajevo [27] where one meter of snow was registered and implied negative impacts on people and property of citizen.

Moreover, the valid risk assessment of BiH has not perceived floods as high risk but the real fact

is: BiH was hit by the floods in 2010 and 2014 as the biggest natural disasters in its history. Almost 90.000 people were displaced, damage occurred at 75.000 houses of which 25.000 were severely damaged or destroyed, 25 casualties were recorded, and also caused extensive damage to livelihoods, health and water and sanitation facilities” [28]. Davis [29] stated that “floods and heavy rains can cause landslides, which can bury building and destroy roads”. Accordingly, in recent time, after any significant rain in BiH there have been problems with landslides, even their influence manifested to the partial closure of the highway A-1, in January, March and July 2018 [30].

In the Study of risk management of landslides in BiH, Abolmasov [31] stated that “landslides have proved particularly problematic due to the lack of well-defined competencies of various institutions that primarily deal with them, then the lack of strategy, lack of information and data (cadaster), forecasting maps (hazards and risks), and finally the low level of awareness of landslides and their consequences for the general public, as well as various levels of government.

Also, UNDP and Abolmasov [31] claimed that experience with floods and landslides in 2014 clearly indicated the need to improve regulation and practice in the management of disaster risks but three years after a massive flood, in 2017, the relevant risk assessments indicate that nearly 500,000 people still live in areas exposed to significant risks of floods and landslides [32].

Looking at these examples above and considering facts and research findings it may be concluded that BiH have minimal investments to the hazards/risk knowledge. There are still many communities, structures, services and geographic areas likely to be damaged. If P&R authorities didn't recognize the possible risks, they couldn't be able to effectively reduce or eliminate negative effects of them, so adequate and permanent updating of risk assessment and preparation of action plans in relation to the updated identified risks is imperative.

Simply, without systematic approach to the hazards/risks knowledge it is not possible to see significant improvement and the development of the system. The process should be performed through a unified and standardized methodology. If we compare methodology update requirements

at state and entity level we are seeing differences. In accordance with legal documents it is required that the update of risk assessment of BiH needs to be carried out at least once every two years. This means that its update should have been done in 2014, but it has not been updated so far. On the other side of Federation BiH updated risk assessment in 2014 and it includes all recent hazards that BiH has faced over last 5-10 years. At the level of F BiH risk assessment is subject to obligatory analysis at least once a year, and in the event of certain changes that significantly affect the change, then updating the risk assessment is carried out immediately [33].

Civil protection administration of RS updated risk assessment for this entity in 2013. Risk assessment of RS is subject to daily, periodic updating, with a comprehensive update every 3 to 5 years depending on the circumstances or changes of key elements that are essential for its credibility. It can be concluded that F BiH skipped to update the risk assessment in the previous three years (2015-2017) while RS should have done it between 2016 and 2018 which means that the end of 2018 is legal deadline for RS to update its risk assessment.

Brcko District has been assigned the lowest score regarding risk assessment which is surprising because BiH faced a series of disasters in the last 6 years and many of them were taking place in Brcko District. Thus, it is unacceptable that some administrative levels of governance are not yet clearly specified the types of hazard/disaster that may threaten their area of responsibility. In April 2018, Brcko District adopted a Decision on risk assessment of Brcko District of BiH from natural and other disasters and Decision on approval of study to strengthen the capacity of resilience to disaster on the territory of Brcko District of BiH. They had help by professional regional company in identifying risk assessment in Brcko district. The adoption of these decisions in April 2018 may be a reason for dissatisfaction of Brcko district respondents to the research survey about incorporation of hazards/risk knowledge element of pre-disaster management realized in June 2017.

In accordance with results of research it is evident that hazards/risk knowledge have been unequally incorporated between different administrative levels of government. P&R institutions at state

and entity level established a methodology for drafting the P&R documents as well as the methodology to prepare risk assessments but those methodologies are not harmonized to each other and their outputs are different. So, the legal framework should enable unified and harmonized methodology and ensure that all levels of government are working according to the same standards. The lower levels of governments may need a help to do so. The best solution could be modules of the European Union, which define different areas of interest within protection and rescue management. "Modules include tasks driven pre-defined arrangements of resources, assembled and made available to respond more quickly to emergencies [34].

Additionally, coordination between organizations is one of the key problems in the protection and rescue system in BiH. Certainly, there is need for significant political support, and more efficient inspection services at all levels.

The Government (specific agency) has to continuously conduct hazards research, which focuses on pre-disaster vulnerability analysis and mitigation. P&R institutions in BiH needs to establish and integrate GIS-based multi-hazard mapping that brings a combined picture of natural hazards in varying magnitude, frequency and areas of effect, to local authorities gathered through Participatory Capacity and Vulnerability Assessment (PCVA), in order to provide relevant information for local planning and decision making, particularly in emergency response, and disaster preparedness and mitigation [35].

Similarly, databases' programs and decision support systems should be established and improved to enable the collection and sharing of information. All lessons learned about hazards of the recent major disasters have to be identified and included into disaster preparedness and mitigation measures as well as transferred to the protection and rescue professional's and policymakers.

Being aware of the fact that it is impossible to avoid disasters, citizen and entities throughout the world are ensuring their lives/property. Unfortunately, in recent years, BiH "has not developed policies to promote/support payments for insurance of life, public and private goods, which is usual in the EU" [36].

5. Conclusion

The core idea in disaster risk reduction is to minimize the risks of hazards and their potential impacts to citizens, their property and environment. If protection and rescue authorities didn't recognize the possible risks, they couldn't be able to effectively reduce or eliminate negative effects of them, so adequate and permanent updating of risk assessment enables development of adequate capability to cope with them.

Thus, a unique methodology of risk assessment, followed by identifying and analyzing each hazard for exposure and vulnerability helps P&R managers to determine risks and their possible effects that will enable development of realistic scenarios and building capability to effectively and efficiently manage a disaster. If this is then audited properly in terms of delivering results and measuring performance in specific areas we may hope for responsible, cost-effective and capable P&R system in BiH.

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Perceptual bias toward gender based leadership: a cross gender study of perceptions towards male and female leaders

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Abstract

The study aims to explore the ways in which female leaders are perceived in a different way than male leaders, where these perceptions come from. In what ways there is difference in their style, their leadership effectiveness, and difference in communication style, their influencing tactics or all these are merely gender stereotypes. Research shows that there is a difference between the leadership style of female and male leaders [1]. This study will explore both the relationship of gender of respondents (business students) and the rating of leadership effectiveness of male and female leaders. The population of the study was the students of various business schools of UAE. Total No of respondents were 150, out of which 76 (51%) of students were female and 74 (49%) of students were male. A visual picture based questionnaire were distributed to the respondents measuring their perception of leadership traits of both male and female against the same attributed and leadership traits and then the variance between the perception of female and male respondents towards male leaders and female leaders was checked. The data was analyzed by statistical software SPSS .20 and the independent T. test were used to analyze the hypothesis. The research confirmed the difference of perception of people towards male and female, however the difference in perception of male and female could not very prominently established. This research paper contributes towards establishing an argument that male and female leaders are perceived differently by the people, and establishes a platform to explore the reasons of such perception building.

Key words: Leadership, Gender Bias, Gender based leadership, UAE Business institutions, Leadership effectiveness

1. Introduction

An organization's capability of effective decision making and inspiring its members to perform well relies heavily on the leadership. Effective leadership calls for the ability of setting and achieving challenging organizational goals and taking instantaneous and critical action in unforeseen and challenging situations, which enables the organization to outperform its competitors, and to take intended risks and to endure the failure. There are numerous studies identifying the qualities in a leader; few believe that he should admire his followers, understand his desires, keep positive qualities in his leadership; other qualities can be that a leader should influence his followers support them and create a good model in front of them [2]. False conception of leadership is reflected by male bias as command and control. Leadership is been defined as process of leaders engaging and mobilizing the human needs of follower. The ability to manage others, self-confidence, strong communication skills, and willingness to accept change are considered to be some of the characteristics of good leaders. Furthermore leadership behavior is been categorized in fourteen i.e. planning & organizing, clarifying, monitoring, supporting, informing, problem solving, motivating, recognizing, consulting, managing conflict, and networking, team building, developing, delegating, rewarding and mentoring [3]. Leadership is a process whereby the managers influence its followers towards achieving a mutual goal; research also concluded that Leadership is manager and its followers rather than some qualities and traits [4].

1.1. Gender Differences In Leadership

Men and women both have different qualities of leadership. They influence their in their own

way. Literature suggests that the gender differences in leadership do exist and those differences style have been studied by various researchers. Men and women have different identity, they both are biologically different. Both have different personality and traits women are sensitive and emotional. Men are assertive and provider. It is believed that males are physically strong than women but this does not conclude automatically that female are any weaker. Men have a whole different personality and women have their own whole different personality. No matter what the gender is, in terms of their personalities, no two persons can be called identical to each other [5]. In the past if women want to become a successful leader than she has to adopt the masculine style of leadership and follow the rule of conduct applied by men leaders. But now-a-days women are making impact on organization by not adopting the style and habits applied by men, but by their own style, by drawing unique way and creating different path. Now-a-days women leaders are perceived as more effective because of their interpersonal skills. Women leaders have impact on society and they are trying to improve the women are perceived in society [6]. Men display more self-assertive and dominant style and less deference and warmth than women [7] [8]. Research also suggests that women as compare to men are considered to be more aware of their emotions can empathize easily and adaptable, whereas men are believed to be optimistic, self-confident, and are better handler of stress. [1] [9] [10]. Transformational leadership style is more adopted by female manager than male manager especially as individual they adopt mentoring follower [8]. In different sex-related meta-analysis found that woman use more democratic leadership style and are more participative or and men use directive and autocratic leadership style [7] [8]. People believe that female leader are warm, expressive, understanding, emotions, compassionate and much more concerned about their and others feeling than male leaders [11]. Effective women managers are believed to be practicing more participative style and effective male managers are considered to be practicing directive style [7][8].

1.2. Gender difference in Communication Style

Women usually use communication as fool to create relationship, show their social connection with people in polite manner but men take it as exert dominance and achieve tangible outcome [9] [10][12]. Communication style of women is more expressive, polite, and tentative while men are more assertive and power hungry [13]. Men and women behavior are different with other in society. Women are more social in their interaction with other while men are more value themselves or their independence [8][14][15]. Women involve concern with other, value co-operation, selflessness and a desire to be with other [16]. Women leaders use their power speech less because they speak politely and use more tag questions [17]. Men are tending to interrupt more than women [18]. Women communication style can became disadvantage for them because when they are interacting with other they more speak tentatively and politely, men speaks more assertively, confidently and capably as leader [17]. Difference in men and women communication style is because they are different planet, men are from mars, and women are from Venus they have different values, though goals and needs [10]. Men are goal oriented because of their ability to achieve result. Women are relationship oriented because of their feelings and by the quality of their relationship. [10] Women think language is a way of establishing and negotiating relationships.

1.3. Gender difference in Influence Tactics

Not only communication style of men and women is different but their way of influencing other is also different. Influence is defined as the ability of a person to motivate the followers and inspire them to change their attitude, believes and behaviors. The ability of a leader to influence its flowers is considered to be one of the most critical qualities of an effective leader. Research has listed few vital influence tactic that a leader uses on its followers, it includes coalition tactics, rational persuasion, consultation, inspirational appeal, ingratiation, legitimating tactics, pressure and personal appeals exchange [19]. Pressure occurs

when one intimidates to comply by using demands, threats and persistence. Influence tactics are divided into two groups: (i) “hard” tactics which means exchange, coalition, legitimating, and pressure and (ii) “Soft” tactics which means inspirational appeals, personal appeals, rationality, ingratiation and consolation [20]. Male leaders use hard tactics at women employees and soft tactics at men whereas female leaders use soft tactics with both male and female employees [21].

1.4. Gender Stereotypes

Gender stereotypes are facilitated by the surrounding environment of one's: social setup, friends, the media school, family, are factors that determine the perception of an individual [22]. Research advocates that an effective leader whether male or female should have the ability to influence the followers' attitude, behaviors and characteristics [8]. Female stereotypes have some common traits: affectionate, emotional, friendly, mild, appreciative, pleasant, warm, sentimental, sensitive and sympathetic, whereas stereotypical male's traits include rational, aggressive, tough, ambiguous, unemotional, forceful, dominant, active, and self-confident [23]. These characteristics are supposed to be responsible for enforcing gender discrimination at workplace for female leaders and can affect their performance adversely. These stereotypes represent that female leaders lack those qualities which are considered to be the must-have traits for effective leaders; this in turn strengthens the perception that female leaders don't compete well to male leaders for top management position [24]. Perceptual difference between male and female leaders is seen by society's socio-demographic and affecting others' attitudes, observations, behaviors and evaluations of persons, specifically a woman's abilities to lead the organization [8].

1.5. Similarities in leadership styles of both genders

Numerous researches on gender difference in leadership effectiveness found that women are similar to men in many qualities, beliefs, and perception and rated less influential than men [25]. If masculine leadership style portrays people assume that man-

ager or leader must be man [26]. [11] found in a research that a female manager was reported to have attributes including better people relation skills, positive interacting with others, helping people enhancing their self-worth and sharing the resources and information. It was also reported that the woman's nature helps establishing an enabling environment which is somewhat more effective than male managers [27] [28]. Some researchers found no difference on gender leadership style; there is no quantifiable difference between men and women in leadership role because roles are extremely situational; this line of literature says that no one is better in leadership position either men leader or women leader. Effectiveness of leadership style is contingent on environment of organization [29]. In contingency theory it is explained that no style is best style but leadership effectiveness depends on behavior interaction and on situation. In accordance to traditional gender roles, men and women are perceived to be better and effective leaders by their subordinates [7]. In non-traditional roles men and women leaders are found ineffective but in stereotypical role male and female leaders are perceived as more effective leaders. In male-dominated roles women leaders lose their authority if they employ feminine style of leadership. Men and women are both equally effective leaders. Men and women are more effective in roles that were appropriate to their gender [8].

1.6. Problem statement

Research shows that there is a difference between the leadership style of female and male leaders [1] [10] [12] [13] [30] [31]. Women are stereotyped because of their caretaking skills such as supporting and rewarding. But men are perceived as superior leaders possessing skills such as influencing, controlling and delegating responsibility. The need is to explore the ways in which female leaders are perceived in a different way than male leaders, to identify where these perceptions are coming from and to categorize how male and female leaders are different in their style, their leadership effectiveness, and difference in communication style, their influencing tactics or all beliefs are merely gender stereotypes. This study will explore both the relationship of gender

of respondents and the rating of leadership effectiveness of male and female leaders

1.7. Hypothesis

H1: There is significant difference in perceived leadership styles of male and female H2: There is difference in the Perception of Males and females regarding different gender leaders.

1.8. Research question

1. There is difference in perceiving leadership style based on gender by students in general?
2. Female students have difference in the perception of leadership style of leader based on their gender?
3. Male students have difference in the perception of leadership style of leader based on their gender?

1.9. Significant of the study

The importance of this study is to know that how future leaders (business students) perceive leadership roles on the bases of gender. Business students were the respondents for this research. It is important to study the students' perception towards gender based leadership to understand how this affects their future work environment. Men and women have different identities and leadership qualities, but these differences should not be predisposition to what men and women are capable of. The research results will give an insight to male and female leaders to work on perception management for improved business results. The research will be a significant addition to the literature of leadership in general and gender based leadership in particular.

2. Methodology

2.1. Instruments

This study used a borrowed research instrument from kapankeh [1] which is based on four pictures with written narrative description. Each respondent was given one questionnaire with four types of leadership styles out of which two were

male and female, two were effective and two were ineffective. Group questionnaire technique was used for data collection. Respondent were divided into two half for each respondent group and two different questionnaires were made having similar leadership characteristics but opposite gender of leader for each group. One half of the respondents were given questionnaire that contain a male leaders' picture with description of having the qualities of an effective leader and other half were given a pictorial questionnaire having a female leaders' picture with the same description. Next picture in questionnaire was a picture of an effective female leader which description of having the qualities of an effective leader, whereas, the other half of respondents were given male leader's picture the same description. Third picture in questionnaire was an ineffective leader who was female and other questionnaire contain male leader with same description and name and that leader was ineffective. Last picture of questionnaire was a female ineffective leader with written description and other questionnaire has an ineffective male leader's picture with the similar description as for on first half respondents. At the end of every description there were two questions and respondents were asked to rate their perception of effective leader ability for each leader on a likert scale. Questionnaire also asked about the gender of the respondents to trace any difference in the perception of different genders about gender based leadership.

2.2. Data collection

The population of the study was the business student of five universities of Dubai, UAE including, (1) Al Ghurair university, (2) AMITY University, (3) SZABIST Dubai, (4) University of Modern Sciences and students and (5) IMT Dubai. Total No of students were 150, out of which 76 (51%) of students were female and 74 (49%) of students were male. The questionnaire were distributed among students through convince sampling.

2.3. Analysis tool

This data of this research were analyzed by statistical software name SPSS .20 and the independent T. test was used to analyze the hypothesis.

3. Data analyses

The respondents were asked to rank on a likers scale, their perception about the effectiveness of leaders shown in the pictures. The result will be discussed in three ways i.e. (i) what is the general perception of respondents about the leadership style of the leaders shown in questionnaire, (ii) is there any perceptual difference between the effectiveness of male and female leaders shown in the questionnaire and (iii) is there any difference in the responses of male and female respondents about perception towards gender based leadership? Following analyses explain the characteristics of four leaders and the result from question-

naire is shown in tables following description. There are two tables for each leader, one table addresses group statistic and other discusses the independent sample test, showing the acceptance or rejection of hypothesis.

At one time two groups of respondents were given similar leadership descriptions of four leaders with opposite gender for each description. i.e. if group A got some description of leader as male Group B got same description but as a female leader. It is assumed that if everything else remains same the different answers are only because of the perception towards male and female gender. Following is the details of information provided by respondents.

Picture for Group A Respondents		Picture for Group B Respondents	
 Jamie	Description: Jamie is a school administrator. Jamie is a very caring person and wants his employees to be happy, so he checks in with the employees often. Jamie takes time for everyone's personal needs, but does not take time to evaluate their work performance. Questions 1) How would you rate Jamie as a leader? 1 2 3 4 5 Very Poor Poor Average Good Very Good 2) How would you like to have Jamie as a boss? 1 2 3 4 5 Very Poor Poor Average Good Very Good	 Jamie	

Table 1. Group Statistics

Table 1: Group Statistics					
question type		N	Mean	Std. Deviation	Std. Error Mean
Jamie1	A	75	4	0.69749	0.08054
	B	75	3.9867	0.62587	0.07227
Jamie2	A	75	3.7733	0.72733	0.08398
	B	75	4.12	0.65677	0.07584

Table 2. Independent Samples Test

		Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Jamie1	Equal variances assumed	.504	.479	.123	148	.902	.01333	.10821	-.20050	.22717
	Equal variances not assumed			.123	146.296	.902	.01333	.10821	-.20052	.22719
Jamie2	Equal variances assumed	1.938	.166	-3.064	148	.003	-.34667	.11316	-.57028	-.12305
	Equal variances not assumed			-3.064	146.485	.003	-.34667	.11316	-.57030	-.12303

LEADER # 1 – JAMIE

The research results show that the respondents perceive that there is a little difference in leadership style based on gender as in looking at the mean scores of the groups of students it is evident that the mean scores are not very different. In this case H1 is accepted as respondent think that there is some difference in the perception of leadership style of a leader.

Leader # 2 - KELLY

The research results showed that the respondents perceived Kelly male as inefficient leader.

They believe that there is difference in leadership style based on gender and choose female leader Kelly as effective leader and she is better to worked with In this case H1 is accepted. Female respondent think that there is no significant difference in the perception of leadership style of a leader. The choose leader on the base of qualities not on the bases of their gender. In this case HO is accepted. Male respondent choose female Kelly as an effective leader than male Kelly so this shows that they think this is difference in perception of choosing a leader and male students choose leaders on the bases of gender. In this case H2 is accepted.

Picture for Group A Respondents	Description:	Picture for Group B Respondents
 Kelly	Kelly is a manager for a large business. She believes the business needs a vision, and feels it is important for employees to have goals. Kelly prefers to make the decisions and then assigns jobs to her employees. Questions: 1) How would you rate Kelly as a leader? 1 2 3 4 5 Very Poor Poor Average Good Very Good 2) How would you like to have Kelly as a boss? 1 2 3 4 5 Very Poor Poor Average Good Very Good	 Kelly

Table 3. Group Statistics

question type	N	Mean	Std. Deviation	Std. Error Mean
Kelly1	A	75	4.3333	.57735
	B	75	4.2400	.61160
Kelly2	A	75	4.3200	.71961
	B	75	3.9067	.75647

Table 4. Independent Samples Test

		Test for Equality of Variances		t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
									Lower Upper
Kelly1	Equal variances assumed	.033	.855	.961	148	.338	.09333	.09712	-.09858 .28525
	Equal variances not assumed			.961	147.511	.338	.09333	.09712	-.09859 .28525
Kelly2	Equal variances assumed	.220	.640	3.428	148	.001	.41333	.12056	.17509 .65157
	Equal variances not assumed			3.428	147.632	.001	.41333	.12056	.17509 .65158

LEADER # 3 – TERRY

The research analysis suggested that the respondents perceived that there is no such difference in leadership style of any gender both Terry male and female are ineffective leaders, so In this case H1 is rejected. Female respondent think that there is no significant difference in the perception of leadership style of a leader. For them both leaders are equal and choose leader on the base of qualities not on the bases of their gender.

In this case H1 is rejected. Male respondent thinks that both female Terry and male Terry as

an ineffective leader. And they think that this is no difference in perception of choosing a leader whether leader is male or female. In this case H2 is also rejected.

LEADER # 4 - CHRIS

The respondents perceived that there is slight difference in leadership style of gender. And they think that female Chris is more effective than male Chris. They feel liking working with female Chris would be better and effective and male Chris is ineffective, so In this case H1 is accepted Female re-

Picture for Group A Respondents	Description:	Picture for Group B Respondents																				
	Description: Terry is the principal at a local school. Terry works hard, but is often unorganized and has difficulty making decisions. During staff meetings she asks people to do jobs, but then does not check in to see how things are going or if the jobs has been completed. Questions: 1) How would you rate Terry as a leader? <table border="0"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>Very Poor</td> <td>Poor</td> <td>Average</td> <td>Good</td> <td>Very Good</td> </tr> </table> 2) How would you like to have Terry as a boss? <table border="0"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>Very Poor</td> <td>Poor</td> <td>Average</td> <td>Good</td> <td>Very Good</td> </tr> </table>	1	2	3	4	5	Very Poor	Poor	Average	Good	Very Good	1	2	3	4	5	Very Poor	Poor	Average	Good	Very Good	
1	2	3	4	5																		
Very Poor	Poor	Average	Good	Very Good																		
1	2	3	4	5																		
Very Poor	Poor	Average	Good	Very Good																		

Table 5. Group Statistics

question type	N	Mean	Std. Deviation	Std. Error Mean
Terry1	A	75	2.2000	.94440
	B	75	2.3733	.80158
Terry2	A	75	2.2533	.85572
	B	75	2.3600	1.06085

Table 6. Independent Samples Test

		Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Terry1	Equal variances assumed	1.462	.229	-1.212	148	.228	-.17333	.14303	Lower	Upper
	Equal variances not assumed			-1.212	144.192	.228	-.17333	.14303	-.45605	.10938
Terry2	Equal variances assumed	7.497	.007	-.678	148	.499	-.10667	.15738	Lower	Upper
	Equal variances not assumed			-.678	141.655	.499	-.10667	.15738	-.41779	.20445

spondent think that there is no significant difference in the perception of leadership style of a leader. For them both leaders are equal and choose leader on the base of qualities not on the bases of their gender. In this case HO is accepted. Male respondent thinks that both female and male Chris as an ineffective leader. And they think that this is no difference in perception of choosing a leader whether leader is male or female. In this case HO is accepted.

The collective findings of this study result are some respondents think that there is no difference in perceived leadership effectiveness of male and female. Many respondents think that there is no difference in leadership style of male or female.

Which suggests that leader should be effective because of his qualities no because of his gender. However some respondents think that female leaders are more effective than male leaders and there is some difference between male and female respondents on this subject. Over all there are mix results of research establishing the need of why and how these differences are perceived.

4. Conclusion

The study resulted in identifying difference in Responses towards female and male leaders, however it was difficult to ascertain whether male or

Picture for Group A Respondents	Description:	Picture for Group B Respondents
 Chris	Chris is the owner of a company. He believes the business atmosphere and coworker relationship are important to a productive workplace. Chris prefers to have work groups make decisions, and decide how the jobs will be completed Questions: 1) How would you rate Chris as a leader? 1 2 3 4 5 Very Poor Poor Average Good Very Good 2) How would you like to have Chris as a boss? 1 2 3 4 5 Very Poor Poor Average Good Very Good	 Chris

Table 7. Group Statistics

question type	N	Mean	Std. Deviation	Std. Error Mean
Chris1 A	75	4.2267	.64877	.07491
B	75	4.0000	.69749	.08054
Chris2 A	75	3.7867	.66360	.07663
B	75	4.0267	.69697	.08048

Table 8. Independent Samples Test

		Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Chris1	Equal variances assumed	.619	.433	2.061	148	.041	.22667	.10999	-.45599	.10932
	Equal variances not assumed			2.061	147.231	.041	.22667	.10999	-.45605	.10938
Chris2	Equal variances assumed	.260	.611	-2.160	148	.032	-.24000	.11112	-.41767	.20434

female leaders were preferred over others. Mix responses were recorded when it comes to choosing between male and female leaders. In most cases the null hypothesis is accepted, however in some cases female leaders were considered to be more effective than male leaders and responses varied gender wise also. This result of this study is in line with few other researches where it was proved that male and female leaders were perceived to be equally effective[30]. [1] Concluded in his study of perception of leadership reported that there was no significant variance was found regarding the effectiveness of female as male leaders as perceived by the respondents. The result of this study makes some progress in way to help bridge the gender gap. The research result showed a positive perception of respondents towards gender based leadership. However this gives birth to another research area that if the perception towards male and female leaders at society level are indifferent then why these female leaders are discriminated in organizational setting? If business students who are future managers perceive that male and female leader are equally effective, why do women are reported to be underrepresented at top managerial positions in government, politics, corporation, and in other position in leadership and power [32].

Limitations of Study

The data of this study provide the information about the perception of the future leaders' business student of various Universities of UAE. Research results might differ if population is changed. A limited sample size of 150 male and female business students has been used; result might get changed if larger sample size is studied. A visual picture based questionnaire has been used a data collection instrument. Focus groups or interviews or any other form of research instrument can bring some additional viewpoints about the problem.

Areas for Further Research

Further research on this gender based leadership is needed to be done to answer that why there are differences in organizational opportunities are reported for men and women. This study raised a new question for further research that generally and individually students felt men and women equally effective leader. But individually he or she

felt themselves as capable as effective leader. Further research is need to determine that there is any difference in students perception towards gender based leadership after they join the organizations for various in leadership roles. Moreover additional research is needed to discover that the perceptions of gender differences in leadership are different beyond the professional students or not. The review of this study literature saliently portrayed that female leaders are perceived to be nurturing, passive and sensitive whereas men are considered to be strong, assertive ad efficient. Need is to confirm these hypothesis drawn in various researched. Furthermore extensive research is need to be done identifying the efforts that have been made to break the gender based leadership stereotypes and ascertaining the needs to further bridge this gap.

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School management and education quality in terms of education reform in Bosnian -Podrinje canton Gorazde

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Abstract

The main goal of this research is to understand the management role in the realization of the educational process as well as in the implementation of reform process in Bosnian - Podrinje Canton Gorazde. This research includes all seen primary schools in the Bosnian – Podrinje Canton Gorazde. Twenty five (25) respondents took part in this research: seven principals, four vice-principals and fourteen expert assistants.

The methods used in this research are: survey method or empirical-non experimental method, theory analysis method, method of analysis of pedagogical documentation using interview and scaling with the appliance of questionnaires for principals and expert assistants in primary schools.

The research showed that school managements have positive attitude towards education reform but that they are not the key factor in that process. The results of this research can be used to create better conditions for the reform implementation and unloading of the school principals at support for material work conditions in school. We should dedicate more to improve the quality of teaching process and help teachers.

Key words: management, education, reform, quality

1. Introduction

School management is a relatively new expert area. Not that much as practice as much as science and theory. As in any new area the inaccuracy and obscurity appear in school management as well. They are particularly visible in terminology. There are different annotations of this area, however all the obscurities are additionally encouraged by overtaking of terms from other speech areas where terms are not arranged yet. Nevertheless, most of the Euro-

pean (as well as world) educational glossaries base their definitions on the American terminology, adjusting them to their languages. There is big inequality in the content and the area covered by school management. Most of the authors are focused on school and education. When it comes to the whole expert area the syntagm management in education is used. Therefore management in education connotes 'Adjusting human, physical and financial potentials to achieve the goals of education overall' (as function). That term includes governance of the whole education, management of educational institutions, leading educational and other staff in educational institutions, internal development and organization of working process in the school. Management in education is at the same time the term for expert area, scientific discipline, profession and function.

We can talk about management in education in broad sense as about governing and managing in the whole education (educational management), and in narrow sense, as about governing and leadership in school and about the job of manager of educational institutions (school management). Management appears in education considerably later than in economy and even later than in some other areas. The reason is notably in social status of education. Education as activity has been centrally managed in most of the countries until recently. The manager role was the transfer of the decisions brought on the level of the central state policy. By decentralization and bigger decision autonomy the greater responsibility is transferred to the lower level of decision-making. The manager is expected to make decisions independently for the benefit of school and pupils and to ensure the quality realization of those decisions. The emphasis is on the importance of good management.

Contemporary understanding of good management emphasizes concern for the human potential

because human potential is the specific thing that contributes the quality of achievement in all areas of human work as well as in education. Such development of things assigned desirable profile of good manager. He is supposed to be more of a leader than manager. What is the difference between management and leadership, i.e. the manager and the leader?

Management and leadership are often in colloquial speech and not frequently in expert literature as well used as synonyms. Recently, however, specialist literature emphasizes a clearer distinction. As the main criterion in their distinction the attitude towards people and their virtues is being imposed. Management is mainly connected with the appearance of organizational life such as planning, analyzing, organizing, financing, surveillance and similar whereas leadership is connected to people, their behavior, working style, communication, motivation and similar.

Emphasizing the difference between manager and leader it is usually stated that 'the manager sustains systems, depends on the control, has a short-termed view on things, accepts status quo whereas the leader motivates, encourages, gives energy, has a long-termed view on things and he has a vision, challenges and changes the status quo'... 'Management is conducted on things, leadership on people. The function of the management is to command and control and of leadership to explain the course of changes and to recruit the members of an organization for the change process [1]. Leadership means the existence of an enlightened vision in that what the institution is and what it can become but also the ability of lead the others to accept that vision' [2,3].

School management is a very difficult and complex job. Each organization requires that it develops and progresses. Our school today is able to progress more and more, we only need people who want to change and take risks. Directors must strive for good preparation, planning and realization of certain goals of the school, with the goal of better results and satisfaction of all participants of this organization [4].

Successful leadership is only one of the many skills that good manager needs to have. It is characteristic for the managers to follow the regulations and business politics of the superior while

leaders follow personal intuition and encourage innovations. While managers are rational, leaders are emotional. Managers lean towards traditional solutions, leaders are suspicious of them. While manager dominates people asking for the obedience, leader is followed by people who have chosen it to do so freely. Manager uses formal procedures and rational methods whereas leader stirs emotions and distends passion [5].

Famous theoretician of educational management and leadership, Tony Bush, claims that there is no general definition of management (especially not in education) because its development is accomplished in different scientific areas (sociology, political science, economy and general management) and therefore it is comprehensible that its different aspects are emphasized as very important. According to him, management in education is specially oriented towards establishing purpose and goals. Leadership, however, is characterized by: influence on people to engage in activities, their connection on important values and acquiring them to accomplish the vision [6].

Management and leadership differ but they are both important. The challenges that are put in front of modern organizations imply full reality of management as well as the devotion to profound leadership towards alluring vision [7].

Transformation of the management into the leadership started in 90s in the last century, visible in many new studies. About 20 years ago, it was talked and written about management in education, in last 10 years it has been spoken about management and leadership in education, and nowadays more and more about leadership- leadership in education. In order for the principal to successfully accomplish his managing role in broad area of operation duty it is necessary to have certain competence.

Competence that principal (director) has to have are named in some countries as Principal standards, competence standards or competence principal profile. They include rich inventory of knowledge, abilities, skills, characteristics, attitudes, values that every principal should have in order to successfully accomplish goals, duties and school program.

Standards mainly arise as a result of educational policy goal analysis in one hand, and empirical research of principal in function of making those

goals come true in school practice in other hand. They are generally established at national level and they represent the basis for the election, qualification, monitoring and (self) evaluation of the principal. Through different analysis we came to conclusion that standards are inevitable way if we want to increase the efficiency of the preparation of the principal for the function that awaits him. They determine the content and the direction of his professional development. Not only that standards determine what principal should know and be able to do, but also how his knowledge can be certainly affirmed. Furthermore, good standards are based on acceptable leadership concepts and are oriented towards activities that ensure higher level of validity of teaching and students' accomplishment, that is, they are oriented developmentally. Almost every country that keeps education and its implementation in educational institutions important develops competence standards for principals as well as for teachers. Management job is job with people which requests understanding of people meaning the knowledge, appreciation and appliance of the basic psychology principals. The content that is the subject of psychology of management can be classified in four basic groups and that are:

- Basic managerial functions,
- Basic managerial roles,
- Psychological characteristics of manager, associates and organization,
- The influence of stress on the efficiency of manager function

1.1. Basic managerial functions

Mainly there are four basic functions of management: planning, organization, leading, controlling and recruitment.

1.2. Basic managerial roles

Managers perform their basic functions through large number of status roles which connote certain behavior set and as most often managerial roles we can single out: informing, preparing the decisions, solving conflicts and awarding. Mintzberg [8] groups managerial roles into three basic categories: interpersonal roles, information roles and decision roles.

a) Interpersonal roles are direct consequence of the authority that comes from the manager position and they relate to the work with people as main area of managing job. Within this group Mintzberg differentiates three basic roles that managers should do:

b) Informational roles of the management relate to the jobs of receiving and giving the information within but also outside of the organization. In order to successfully do his job manager has to dispose with relevant information. There are three main roles within this group: monitor, raiser and speaker.

c) Decision roles represent quintessential dimension and activity of manager. Main roles in this group are: organizer, riots and crisis leader, resources scheduler, negotiator.

The listed basic managerial roles supervene that management takes the obligation and the responsibility for all organization matters regardless of what kind of organization it is. School as the institution of important social interest demands scientific research of management and leadership problem. Nowadays it is written and discussed a lot about the importance of the management for the business success of any institution. It is spoken of the importance of planning, organization, control and managing. However, it is little spoken of the importance of leadership that contains all mentioned functions and especially ethical and other human virtues which influence other people to do their job better, conscientious and more responsible. In his book 'Developing the Leader Within You' John Maxwell states one important principle: **'Everything succeeds and fails depending on leader.'** The success of every individual depends on the success of the leader. There are huge differences between the leader manager and average manager. These differences can be seen within the frame of following statements-characteristics [9]:

- To gain the knowledge about how something is done is the task of the worker.
- To show something to the others is the task of the teacher.
- To check if the job is done correctly is the task of the manager.
- To inspire others to work better is the task of the leader.

We will overview shortly earlier mentioned terms of management and leadership.

Management is highly professional activity that requires special knowledge in the management area and it is defined as the making of crucial decisions pointed towards the accomplishment of the defined goals. If we think of school as of social organization, then we are interested in it and the man in it with all his problems. Management and leadership are actually two sides of the same process and they depend on character and essence of social system upon which school exists.

Leadership is important expert job entrusted to the team lead by principal. That is making operation decisions used to realize strategic decisions in practice. Due to impossibility of clear demarcation of management and leadership functions it is very easy that leadership turns into dominion over people, ordering, enforcement of special will and tyranny, denial of basic human rights and freedoms, abuse and so on.

Director consolidates general and professional governing of school, creates the conditions for the governing body to work, obeys their decisions, protects the school interests and the interests of wide social community and therefore he has to be honorable and highly ethical person. He needs to be accepted from the collective, person that can be trusted, the person that people will follow in success as well as in the trouble.

1.3. Leadership styles

Contemporary theoreticians differ following styles of management/leadership:

- Democratic style of leadership, autocratic style of leadership, liberal style of leadership, social support style, positive feedback style, laissez-faire.

The 'clear' styles are rare in practice; they are often the combination of two or more styles.

Director in the education coordinates, integrates and adjusts the work of all participants in the educational work to accomplish better success in the acquiring of knowledge and skills of the young generation.

H. Mintzberg says: 'Director spends 1/3 of his time on the conversations and agreements with the

executors of the work, 1/3 with the subjects of his institution and 1/3 on the contacts with the superiors, visiting his employees and on thinking. [8]

Nowadays it is accented in theory and practice that before he overtakes the duty, director should think of the following:

- That he should and could know more than the other members of the staff,
- That he is positive example to the others in the execution of his obligations and that he successfully coordinates and inspires work of others,
- That he knows realistically plan and program overall school work,
- That he is brave enough to take the responsibility for eventual errors whereat he protects the employees and the school as educational unit,
- That he respects associates and other workers and emphasizes their success and not only his, which is common in our places,
- That he has reputation and trust that he gained with his work,
- The thing that is trend in the world, and it comes to our places, is related to certain standards which every contemporary school should have, and those are:
- Contemporary ideas about studying (it is taught how to learn instead of simple reproduction of the knowledge, critical thinking, problem solving, etc.),
- New teaching methods (ICT, group assignment, project work, reporting instead of reproduction),
- Schools as organizations for learning (where not only students learn but also the staff and the organization),
- Better qualification of the school for the innovations.

According to the listed quality standards that every school should fulfill there are certain competences that director of the school should have in order to cope with all set tasks in the school. Below we will list what a contemporary school leader should have:

1. He has knowledge about contemporary learning and teaching,
2. He develops common vision of education and is able to turn it into specific actions,

3. He is capable of changing the organization culture into organization for learning with innovative teachers that are able to revolve things,
4. He know how to organize teachers to optimize school organization,
5. He helps the staff in their professionalization,
6. He is able to provide resources and determine financial priorities to accomplish common vision,
7. He knows how to engage parents, community, labor market organizations, municipalities, etc.
8. He knows how to strategically think: works on the long term policy planning,
9. He has the true leader qualities and can apply different leading styles,
10. He has innovative skills,
11. He is able to direct people (convince, recruit, set guidance and goals, form working groups, etc),
12. He has communication skills (including the conflict resolving skill),
13. He is in control of his personal life (for example, he is able to cope with stress and similar).

2. The goals of the research

The goal of this research comes out of necessity to define the position of the school management and the method to improve quality of education.

Starting with the problem and this set goal of the research and problem defined like this: 'School management as well as the other educational subjects has certain difficulties in the rising of the education quality', the tasks of the research were set.

3. Tasks of the research

In order to accomplish certain research goals it is necessary to realize individual research tasks, and those are:

1. Analyze and study legislative side (Outline law on primary school education, Primary school education law of Bosnian - Podrinje Canton Gorazde, Primary school pedagogical standards in Bosnian - Podrinje Canton Gorazde):

2. Analyze school readiness for reform implementation (teaching aids, environment, furniture, teacher education, material possibilities...)
3. Research the attitude of principals and expert associates in primary schools in Bosnian - Podrinje Canton Gorazde towards the reform implementation (principal's role, school equipment, teacher education, financial support, parent collaboration).
4. Define measures of improvement of reform process and inclusion implementation (communication, collaboration with family and community, educational work in school, quality measurement).

4. Research methods

Following methods were used in this research: survey method or empirical-non experimental method, theory analysis method, method of analysis of pedagogical documentation using interview and scaling with the appliance of questionnaires for principals and expert assistants in primary schools.

Seven primary schools in Bosnian – Podrinje Canton Gorazde have been chosen for this research. Twenty-five (25) examinees took part in this research: seven principals, four vice-principals and fourteen expert assistants in primary schools.

5. Research results

Law regulations in Bosnian – Podrinje Canton Gorazde are completely ready for reform and its implementation in practice. Hereinafter we will look at some of the Law articles related to the reform changes [10].

In the **Article 1** it is stated that the purpose of the education is that it through the optimal intellectual, physical, moral and social development of the individual and according to its possibilities and opportunities contributes to forming the society based on Law domination and respecting human rights. Also it should contribute to its economical development which will ensure better life standards for all citizens.

In **Article 2** the general goals of the education are stated, i.e.:

Article 5 states that the primary school is the institution where the education of the students of normal psychical and physical development is done as well as the education of the students with special needs in psychical and physical development, primary music education, additional education of talented students, and primary adult education. Primary school can be: regular, special and parallel.

In **Article 6** it is said that primary education is obligatory for all children and it is free. Child, in the purposes of this Law is any person until he turns sixteen.

Article 7 predicts that the languages of the constitutive people in Bosnia and Herzegovina (Bosnian, Serbian and Croatian) will be used in all schools according to the Constitution of Bosnia and Herzegovina.

In **Article 10** it is said that the school will improve and protect religious freedom, tolerance and culture of dialogue.

Article 12 states that Canton provides the funds for the establishment and work of schools according to the Pedagogical standards and School environment normative, equipment, teaching assets and aids for the primary school education in the area of Canton.

School board administrates the primary school and it consists of five members. The chairman and members of the School board are appointed and dismissed by the Canton government.

One of the most important links in the school functioning is the Principal. The Principal of the primary school can be person that beside general requirements also has five years of working experience in teaching, and he converges in his work, abilities of organization of educational work in pedagogical theory and practice. Primary school principal beside work and assignment predicted by Law does the following jobs too:

- Takes care of the Law and general acts implementation
- Suggests the primary education program and activities for the improvement of that work
- Decides on the scheduling of the teachers and other school employees to certain jobs
- Reports on the school success and accomplished results in school work
- Employs other employees

- Signs the contracts for work with the school employees
- Does other jobs and tasks.

Law regulations in Bosnian – Podrinje Canton Gorazde are completely ready for reform and its implementation in practice, Law articles such as no.1,2,5,7,10 and 12 are related to the reform changes.REF.

Financial support to schools

When it comes to the financing of the educational institutions in Bosnian-Podrinje Canton Gorazde it refers only on the fulfillment of the basic requirements for the institution function. The treasury system of dealings is introduced a long time ago and it centralized everything. Economic code that refers to the equipment supply is minor if we take into consideration that our schools are poorly equipped. Schools that have been totally destroyed came into better position because they are equipped with new furniture. Those that had not the same destiny still have the furniture that is decades old. Since 1996 reconstructions of the schools have been done but it only referred to the decoration of the school environment and the supplies of the school furniture. The classrooms were empty and when it comes to the cabinets and cabinet teaching it did not exist at all. The amount for the equipment supply is insufficient for the realization of certain projects and therefore school tried to purchase the equipment applying to the Public calls which were useful. However, to realize some projects it takes years. Projects that are realized are: reconstruction of school objects, equipping the cabinets for chemistry, biology, IT, technical education, geography, history and the supply of the school books for the school library. Beside this it is necessary to maintain the object regularly as well as the equipment, school vehicle, small repairs and everything else during a year. The entire burden about the applying on different calls, school organization with modest means and everything else needed for the public institution to function is on the school management.

Teaching materials and equipment

Introducing the educational reform in school year 2004/2005 there was the minimum of the

teaching materials and equipment necessary for the nine-year education realization according to the new methodology provided for new mode of education. Thanks to the involvement of some schools in Step by step project in which they were included from 1999 schools had at their disposal particular teaching supplies that were necessary for the realization of certain teaching contents. The assets that were at disposal were suitable for the first semester in the first grade. As students moved to the higher classes the necessity for the additional material was higher and there was less and less of the material. Every year school applied through different projects to certain donators and in that way it managed to supply certain school materials. What Pedagogical standards predicted was not even close what was needed. The equipment in lower classes is bigger than in higher classes because certain nongovernment organizations were more focused on lower classes. For higher classes the most equipped were the IT cabinets while the biology, chemistry, technical education cabinets were constantly being equipped. In the conversation with the primary school principals I Bosnian-Podrinje Canton Gorazde we got several answers.

- The school equipment is still on unsatisfying level and in the period of reform implementation in 2004/2005 it was much more difficult.
- With the help of the Centre for educational initiatives Sarajevo and UNICEF, school got the furniture and some school supplies for several classrooms in lower classes with the beginning of the reform.
- Some classrooms had only benches, chairs and blackboards so that was a sad environment for teaching.
- For the reform implementation the better conditions were needed and we consider that all was up to the school and principals. Each of us has to manage on our own in order to enhance the working conditions in our schools. Funds that were given for the realization of certain projects were minor and it took several years to realize those projects. Schools are even nowadays poorly equipped and the process is very slow. Principles have to manage on their own and to apply to donators for certain assets. We

are not experts for project writing but we manage in it somehow. During the pursuit of the function of the principle there was not even one seminary for principles in order to educate ourselves for certain segments in our job. A lot of time is wasted on administration so there is a little time to devote to teaching, teachers, students and parents.

Textbooks and Teaching plans and programs

In the conversation with teachers and professors about textbooks used in the Bosnian-Podrinje Canton Gorazde we got a set of answers:

After the evaluation of Teaching plan and program from the first to the ninth grade in the nine-year primary school some of the arguments that we should pay attention to were attached for the making of the Teaching plan and program for nine-year education:

- First term in the first grade is predicted for the adaptation, socialization and communication development with pupils while in the second term it is predicted to realize the teaching materials which is due its capacity and time limit not adequately realized (the planned teaching material is covered quickly) and there is no time left for the revision and practice.
- Because of the process of adaptation, socialization and communication development with pupils in the first grade it is difficult, almost impossible to teach in combined classes where we have the first graders.
- There is no correlation in the teaching materials between subjects. Teacher is free to plan and create the materials but if we consider that pupils in the first grade do not know numbers then how to direct pupil to certain page to correlate the material between subjects.
- Textbooks usually present one area and then the other which causes indifference in pupils and monotony especially when it comes to geometry.
- The materials that cover physical and health education are globalized and teachers have many difficulties in planning the activities to realize the plan and program.

- Certain textbooks have content that is not appropriate for the age of pupils.
- There is inconsistency in textbooks and teaching plan.
- Introducing nine-year system pupils got more burdened than in the previous system.
- Plans and programs are made for the class that follows and therefore we who realize those plans and programs have no insight into what should be the final in the ninth grade. Because of that plan and program there is the overwork in certain grades.
- We think that moving the age limit from the seven to six in entering school did not gain the improvement and better quality in education.
- There should be testing of the students at the end of the fifth grade and at the end of the ninth grade to see the quality of the nine-year education.

Introducing the education reform teachers were given the freedom to choose the textbooks for their subjects and it lead to the confusion and more than one textbook were in use for one subject. Soon it was realized that it was not good and on the Canton the Teaching staff for every group of subjects was created and together they have chosen one textbook for their subject. School management is responsible for the enforcement of the educational process. During the regular activities it is possible to give certain directions and to work on the improvement of the realization of the teaching content.

Education of the teachers

Knowledge, skills and habits gained during the period of graduation-study have to be upgraded and perfected all the time in order to sustain continuous readiness for educational work. One of the basic forms of upgrade and education are regular seminars for all participants in educational process. We will look back at the period before the reform was introduced in Bosnian-Podrinje Canton Gorazde, i.e. period until 2004. Primary school 'Hasan Turcalo Brzi' in Ilovaca has been part of the Step by step project since 1999. First seminary of this kind has been held in Bihac which had about fifty participants: teachers in lower grades, principals, pedagogues from entire

Bosnia and Herzegovina. Our school had four representatives: principal and three teachers in lower grades. Educational initiatives centre from Sarajevo formed Educational centre in Bosnian-Podrinje Canton Gorazde and it was equipped with basic things needed for the seminars (tables, chairs, chart boards, and other material for workshops). First seminar in this Centre was held in 2002 and it was held by the representatives of Educational initiatives centre of Bosnia and Herzegovina. The thirty teachers in lower grades took participation in these seminars. After that the seminars were passed to the local level and they were organized by newly trained lecturers from our Canton. That seminar was held for those teachers who have not passed the beginner training for the implementation of the Step by step methodology. Advanced seminar was held for the teachers who have already passed the beginner training and they have progressed one level up. This training was held in 2005. All these activities happened with formal approval of the Ministry for the education, youth, science, culture and sport in Bosnian-Podrinje Canton Gorazde. In 2011 the Pedagogical department was expanded and therefore three consultants were employed for the whole educational process in Bosnian-Podrinje Canton Gorazde. For more qualitative and better education it is the goal to include larger number of teachers in the seminars organized by the eminent experts. There we come across the problems when teachers should go to seminars because it is needed to pay the registration fees for the seminars. With all the desire of management and teachers these seminars are being avoided. Because of the treasury business school management is powerless in these situations and they have to adjust to the situation. The reason for this attitude towards the education is that education is considered to be consumer activity. It is insisted on reducing everything to the minimum. We can see that this is also additional problem for the school management in the process of the implementation of modern methods and the implementation of the educational reform.

Pedagogical standards

In the order to provide the most qualitative reform in our educational process we have to take into consideration the Pedagogical standards as the

beginning point for the creation of the vision. The reform came into our schools without any special preparation and therefore the Standards are certain unknown term in our educational process. When it comes to Bosnian-Podrinje Canton Gorazde it is approached to the making of the legislative documents anticipated by accepting the reform. Amongst other it is stated that for the purposes of the support to certain pedagogical and material conditions in all primary schools in Bosnian-Podrinje Canton Gorazde Pedagogical standards and general normative for primary education and Working environment, equipment, teaching materials and aids normative have been defined as joint basis in creating basic conditions for educational process and successful accomplishment of its goals and tasks from teaching plans and programs for all primary schools, educational institutions, centers, departments and children's homes. The intention is to modernize and encourage teaching process as whole and to please the requests of teaching plans and programs of certain subjects. Standards define common criteria.

When we review these criteria we can conclude that a lot of things are not fulfilled and there are different conditions for their fulfillment. If we take the number of the classes in schools as a starting point we can conclude that there are schools that do not please this criterion. The main reason for this is the distance from the centre of the Canton and the very creation of certain administrative units in Canton, while on the other hand town schools are overcrowded and have lack of school space. All schools have 50 or 60% of needed equipment for the realization of educational process. Number of pupils in one class varies from school to school because in town schools the standards can be fulfilled in this while in rural areas of the Canton it is impossible because there are not enough pupils to form classes. Law enables to form combined classes in lower grades combining up to three grades to get the number of pupils needed to create the class. The conditions to work in such environment are hard. When it comes to higher grades the situation is also difficult for rural areas because higher grades cannot be combined and therefore small number of pupils in a class is a problem. The advantage in all this is that schools are in 95% of cases filled with expert staff for the process of teaching. Most of the

schools have pedagogue and social worker although in suburban places one person covers two or three schools. Regardless to all mentioned obstacles we try to satisfy all needs of pupils. Those same pupils thanks to their persistence and talent achieve enviable results in all competitions.

1. School management opinion on reform and education quality

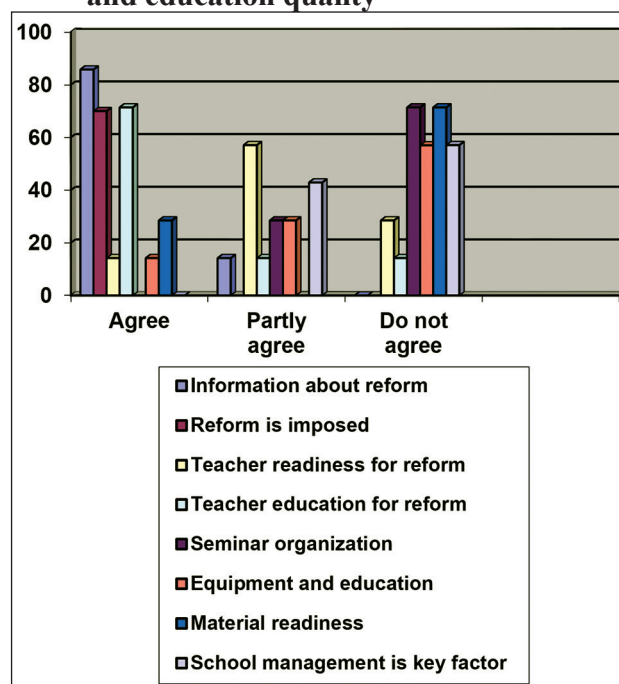


Chart 1. Overview of primary school management opinion on reform and education quality

2. Identity and connection of the management to school

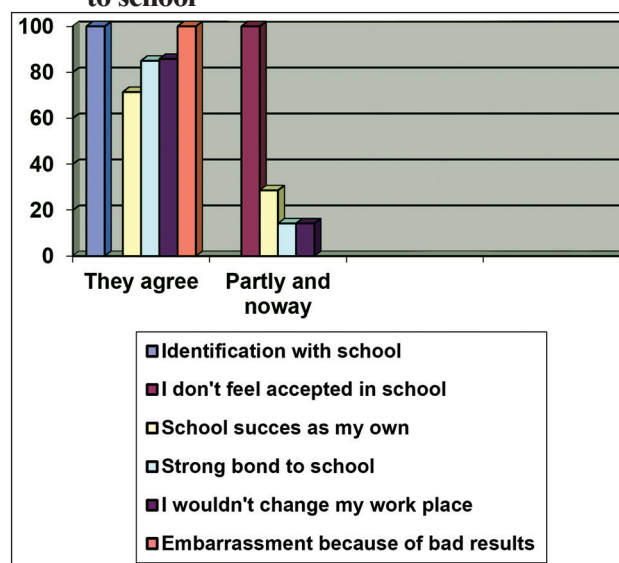


Chart 2. Overview of identity and connection of management to school

Table 1. School management opinion on reform and education quality

Statements (about reform in general)	Completely agree		I agree		I agree and I do not agree		I do not agree		I do not agree at all	
	f	%	f	%	f	%	f	%	f	%
1. I am well informed about primary school reform	9	36,0	9	36,0	7	28,0				
2. I support the concept of regular teaching process that would be attended by pupils who have difficulties in learning	8	32,0	9	36,0	8	32,0				
3. I find starting school with six years old justified and useful for children			9	36,0	8	32,0	8	32,0		
4. I think reform has been imposed on us	9	36,0	8	32,0	4	16,0	4	16,0		
5. I expect a lot from reform	8	32,0	8	32,0	9	36,0				
6. School management is key to the process of reform and inclusive education					9	36,0	16	64,0		
7. Reform made difficult the work for pupils and teachers			9	36,0	9	36,0	7	28,0		
8. Teachers are not asked for an opinion in school reform			17	68,0			8	32,0		
9. I think that changes in primary school are necessary and useful for children of early age	9	36,0	8	32,0	4	16,0	4	16,0		
10. I am educated enough for reform changes	8	32,0	9	36,0	4	16,0	4	16,0		
11. I am satisfied with the number of organized seminars in previous period					8	32,0	8	32,0	9	36,0
12. Teachers are responsible for reform implementation			8	32,0	4	16,0	9	36,0	4	16,0
13. The existing education in Faculties is very good			4	16,0	13	52,0	8	32,0		
14. Some children in school represent the problem and they interrupt the classes			9	36,0	9	36,0	7	28,0		
15. Pedagogue/psychologist helps me with my work	8	32,0	9	36,0	8	32,0				
16. Team of experts helps me in my work	9	36,0	16	64,0						
17. I am overloaded with work in school			9	36,0	8	32,0	8	32,0		
18. Descriptive grading is very complex and it makes teacher's work difficult	8	32,0	17	68,0						
19. During my study I attended the Methodic of inclusive teaching			9	36,0			8	32,0	8	32,0
20. I am able to diagnose/identify the kind of special need in pupil			7	28,0	7	28,0	4	16,0	7	28,0
21. I think I can make individually adapted program by myself					8	32,0	9	36,0	8	32,0
22. Attention is given to talented students too			9	36,0	9	36,0	7	28,0		
23. School has expert team that helps pupils and teachers in educational process	4	16,0	4	16,0			9	36,0	8	32,0
24. Material conditions in school are satisfying for inclusion and reform implementation			8	32,0			9	36,0	8	32,0
25. Collaboration between school and family is satisfying			8	32,0	17	68,0				
26. Government authorities invest enough in education and school equipment			4	16,0	8	32,0	5	20,0	8	32,0
27. School is open to local community	11	44,0	14	56,0						
	5		4		3		2		1	
28. Success in my work I would evaluate with the grade:	11	44,0	14	56,0						

Table 2. Identity and connection of management to school

Identity and connection to school	Answers									
	I completely disagree		I disagree		I agree and disagree		I agree		I completely agree	
	f	%	F	%	f	%	f	%	f	%
1. I am pleased when it is spoken good about my school in the environment									25	100
2. I don't feel accepted in my school group	17	68	8	32,0						
3. I feel that school success is like my own success			8	32,0			8	32	9	36,0
4. Most of the teachers has strong bond to this school			7	28,0			10	40	8	32,0
5. I would love to go to some other school	9	36	9	36			7	28		
6. I am embarrassed when my school has bad results					7	28	7	28	11	44,0

Table 3. The contentment of management by apparition in school

Contentment by apparition in school	Answers									
	I am completely content		I am mostly content		I am and I am not content		I am mostly not content		I am not content at all	
	f	%	f	%	f	%	f	%	f	%
1. Social treatment of school	8	32,0	8	32,0	9	36,0				
2. General situation in school			25	100						
3. School management behavior	15	60,0	10	40,0						
4. Human relations among teaching staff	8	32,0	14	56,0	3	12,0				
5. Working habits and culture of behavior of pupils			15	60,0	10	40,0				
6. Collaboration with pupils' parents			11	44,0	9	36,0	5	20,0		

3. The contentment of management by apparition in school

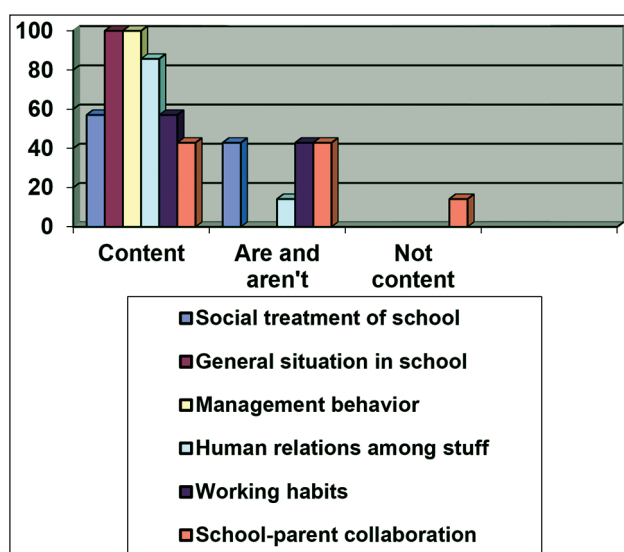


Chart 3. Overview of contentment of school management by apparition in school

4. Desirable personality features for teachers

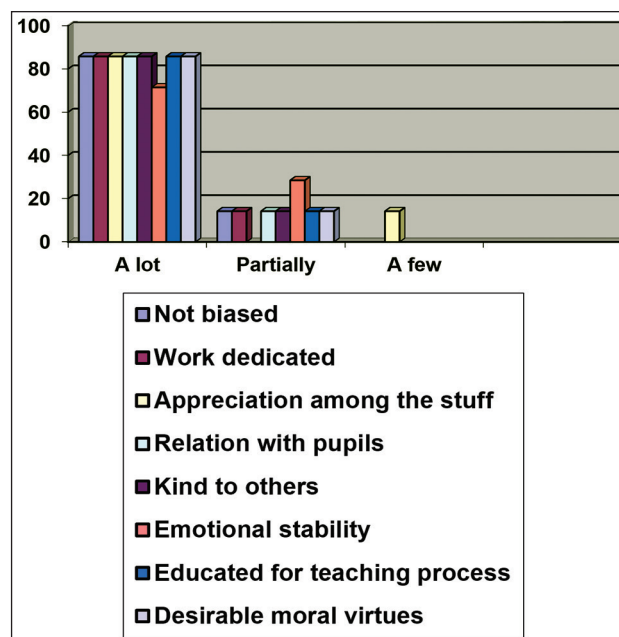


Chart 4. Overview of desirable personality features for teachers

Table 4. *Desirable personality features for teachers*

Desirable personality features for teachers	Frequency									
	There is a lot of those (over 80%)		There are many of those (60-80%)		There is a half of those (40-60%)		There are few of those (20-40%)		There are a few of those (Below 20%)	
	f	%	f	%	f	%	f	%	f	%
1. They are not biased and they treat all pupils the same	9	36,0	9	36,0	7	28,0				
2. They are dedicated to the accomplishment of educational tasks	9	36,0	9	36,0	7	28,0				
3. They are really appreciated	9	36,0	9	36,0			7	28,0		
4. They treat pupils with respect	8	32,0	13	52,0	4	16,0				
5. They are kind and open to others	8	32,0	13	52,0	4	16,0				
6. They are emotionally stable, realistic and facetious	8	32,0	9	36,0	8	32,0				
7. They are educated for the teaching process	13	52,0	8	32,0	4	16,0				
8. They have desirable moral virtues	9	36,0	9	36,0	7	28,0				

The interview has been done in seven primary schools in Bosnian-Podrinje Canton Gorazde. After the interview with all principals and expert assistants in those schools following results were gained:

1. What do you think about the school readiness for reform implementation (teaching materials, environment, furniture, teacher education, material possibilities...)?

- Schools are not adequately prepared for reform implementation including all stated facts such as: teaching materials, environment, furniture, teacher education, material possibilities...
- When it comes to the readiness of schools for education reform implementation I think that a lot has to be done in this field and it will take a lot of time with bigger financial support.
- School founder has not created material and financial conditions in order for schools to be ready for reform implementation.

2. Make overview on experimental classes in school (the purpose of experimental classes).

- All experimental classes were completed successfully starting with didactic-methodical lesson plans through the

expression of personal features to the class management itself. The purpose of experimental classes is to do evaluation of teacher's work as well as the self evaluation at the end in critical review on the class that was held.

- I think that experimental classes are good and certain number of teachers can learn a lot from their colleagues and apply it to their work.

3. Are you content with the reform implementation in school (teacher education, textbooks, plans, furniture, teaching materials, former experiences, inclusion)?

- I am partially content with reform implementation.
- I am not content with reform implementation at all because I consider there was not enough advancement in previous period.
- There are a lot of things that need to be improved. Teachers' education is not satisfying as well as the textbooks quality. Great number of parents avoids the collaboration. Material and financial conditions are weak and plans are too capacious (there is not real time for afterschool activities, remedial teaching and additional teaching).

4. What do you think about the weight put on pupils and teachers, textbooks, program, school segregation, teacher stress?

- If we take into consideration the redundancy of the materials that came out of teaching plans and programs the fact is that pupils are overloaded as well as teachers and that leads to stress.
- When we look at the overall reform implementation we can conclude that there has been overloading and not the unloading of pupils, teachers and teaching contents.

5. What are the measurements for improvement of reform processes (communication, collaboration with family and community, educational work in schools, quality measurement...)?

- Measurements for the improvement of reform processes are: Qualitative and continuous teacher education, continuous collaboration with family and community with the support and help (creating partner relations), projects realization that would secure better working conditions.
- All comes to the financial support from the competent authorities where the situation in pupils' and teachers' family would have changed and therefore the working conditions in school would be improved.
- Immediately provide the continuous education of all involved in educational process with a view to improve communication, collaboration with family and similar. Do quality measuring as often as possible from Pedagogical department and Agency for grading to have insight in real condition about education policy.

6. Conclusions

The introduction of education reform in Bosnia and Herzegovina led to certain difficulties and obscurities in schools. The preparations that should have been done earlier were done in the very reform implementation process. Everything that should have been done in those first steps fell on teachers and school management. It was necessary to equip schools, educate teaching staff, prepare parents and community for these changes. It can be seen that all

conditions were met when it comes to legislative but on the other side we have very different picture in reality. When the reform implementation started in 2004 we only had good will and enthusiasm of all participants in educational process. It started with whatever was at disposal and every school managed on its own to solve upcoming obstacles. Huge burden was on teachers themselves and then on the school management who had to provide minimum conditions that were set in front of schools and them. They tried to provide those conditions through different projects but it went really slow and in small amounts. The additional problem was that teachers were not ready to use new methodologies. There were a few who did teacher education. Ministry of education, youth, science, culture and sport of Bosnian-Podrinje Canton Gorazde had no staff that was able to provide teachers with an expert help when it comes to the implementation of changes. School managements through the collaboration with certain nongovernmental organizations sent teachers to seminars that were dedicated to reform changes. That was a small number of teachers but they came back in every school with new ideas which they immediately shared with their colleagues. In this way we came to certain didactic materials, furniture, literature and other things that teachers needed. Only schools whose teachers were involved in certain trainings and new methodology implementation could get this. Only one classroom was equipped in each school as an experimental class for that school. Donated equipment as well as training for certain teachers has not fulfilled the needs of schools at all. Few years ago the Pedagogical department has been formed as a part of Ministry of education, youth, science, culture and sport in Bosnian-Podrinje Canton Gorazde. Pedagogical department took over the advisory of teachers and seminar organizations for teachers. These educations are held twice a year in Bosnian - Podrinje Canton Gorazde. Educators are the assistants from the Pedagogical department as well as the teachers who decide to share their experiences with their colleagues. It is rarity that the lecturer is the one of the professors from some of the faculties in Bosnia and Herzegovina and the reason is the lack of the funds for those purposes. Some schools do not even have pedagogue or social worker or there is one pedagogue on two schools and the same is with the

social worker. This is especially characteristic for rural schools in Bosnian-Podrinje Canton Gorazde. These are only few things that the process of reform and inclusion implementation is being done on. From the conducted research and stated results we can see up to what measure it has been responded to given tasks.

1. Analyzing the Law on primary school education that was passed by Bosnian-Podrinje Canton assembly on April, 23, 2004 the **first task** has been confirmed: **‘All necessary preparation has been done for the reform when it comes to legislative side.’**

2. Research led us to the results in what extent the preparation for the reform implementation has been done in Bosnian-Podrinje Canton Gorazde.

The **second task** has not been confirmed and it refers to the readiness for reform implementation: **‘Analyzing all given parameters we came to the conclusion that all preparations for the reform implementation have not been done (teaching materials, environment, furniture, teachers’ education...)’**

3. Principles and expert associates took a stand about the improvement of education quality and it says: **‘Principles an expert associates are for the improvement of quality in education but there no material assumptions from responsible institutions.’**

4. **Through the reform process the quality of educational work will be improved but we need bigger investments and better collaboration of all participants in education.**

The process of education quality improvement is not easy; there are certain difficulties, disadvantages and obstacles during this process. We can see that all participants in education are determined for the more qualitative education. From the existing goals and tasks arises that **School management as well as the other subjects of educational process have certain difficulties in improving the education quality.**

The great efforts are put in the whole reform process but the most of the things are not in the direct management authority. Because of that the reform process as well as the improvement of education quality happens slowly.

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An investigation of construct validity of university entrance exams in Iran: A case of reading comprehension

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Abstract

There is a consensus among English language teacher that university entrance exams as a large-scale test is not constructively valid in Iran. To carry out this research, 100 freshman university students, who were studying English Translation in a university in Tehran, were chosen to take part. The aim was to compare their scores in a TEOFL reading test with their previous performance in the entrance exam. For the purpose of data collection, the students' TOEFL reading scores were collected in a TOEFL exam and their performance in the entrance exam was collected based on the scores reported by the administrative officer. A Pearson Correlation procedure was conducted to find the probable relationship between the scores. The results indicated that there was a positive correlation between the two tests. More precisely, the findings revealed that those who scored higher in the entrance exam scored higher in the TOEFL test which in turn confirmed the construct validity of university entrance exam.

Key words: Construct validity; Konkoor; reading comprehension; TOEFL

Introduction

Some Iranian EFL teachers and learners believe that the nationwide, unified university entrance exams (called the Konkoor) are not constructively valid and they do not precisely measure what is expected of them when it comes to their predictive nature. Put it another way, as Kamyab [1] suggests "both quantitatively and qualitatively, the quota criteria have worked against students whose academic performance is superior to those favored by the quota system".

Another disadvantage that is considered as a pitfall for the Konkoor is that although it has been used

as a qualification tool for entering universities in Iran for decades, the Konkoor has not been seriously and fundamentally revised through these years [2].

The construct validity of these nationwide examinations has been a concern for EFL instructors and education managers [1]. In other words, those involved in the process of teaching English as a foreign language (TEFL) in Iran and also assessment processes may have mixed opinions as whether the Konkoor tests what it is supposed to.

Generally, construct validity is defined as "a type of validity that is based on the extent to which the items in a test reflect the essential aspects of the theory on which the test is based, i.e., the construct" [3]. In other words, construct validity is concerned with how well a test measures what it claims.

There have been a number of studies in Iran, investigating the validity and reliability of the Konkoor among them Farrokhi-Khajeh-Pasha, Nedjat, Mohammadi, Rad, Majdzadeh, Monajemi, Jamali & Yazdani [4] on its predictive validity for predicting medical students' academic performance, Sazegar and Motallebzadeh [5] on its reliability, content and criterion-related validity, and Yarmohammadi [6] who investigated the extent to which language skills are tested in Konkoor.

However, to the best of the researchers' knowledge about the literature and the research conducted in this area, no study has attempted to investigate and assess the construct validity of the Konkoor in relation to reading comprehension skill.

Therefore, this study was an attempt to measure the construct validity of a university entrance exam with regard to the test takers' English reading comprehension skills. To carry out the study, the following research question was formulated:

How accurate Konkoor examination is in assessing Iranian EFL learners' reading comprehension?

Hence, EFL teachers who wonder whether the results of their learners' reading comprehension in the Konkoor accurately measures their reading comprehension skills can benefit from the results of this study. Also, education managers and test developers can take advantage of the findings of this study in reforming their assessment views for the Konkoor and other nationwide examinations.

Literature Review

The Konkoor: History

Konkoor (in French: Concours) is the name of a test conducted in some countries such as Iran, China, Turkey and South Korea, to assess and evaluate scientific knowledge of volunteers entering universities. These tests are conducted in European countries and the United States.

Konkoor is a comprehensive multiple-choice exam that usually lasts 4 to 5 hours –depending on the major-and covers all of the subjects taught in high schools, ranging from math and science to Islamic studies and foreign language. The exam is so strict that normally students spend a year preparing for it; those who fail are allowed to repeat the test in the following years until they pass it.

The first Konkoor in Iran was held in 1969 in which 47,703 volunteers participated. Questions for the first course of the exam were designed as short answer questions. Since then, Konkoor is held every year in July. The 2017 exam was the forty-ninth in which 929,791 took part.

The exam is designed, held and administered by the Education Evaluation Organization –briefly referred to as Sanjesh Organization in Iran- which is the sole organizer of Konkoor. Sanjesh Organization has been established by the Ministry of Science, Research, and Technology to supervise all aspects of the exam.

In the early years of the 1990s, another criterion was added to Konkoor for selecting students. The move was aimed at localizing the student population by giving priority to those candidates who applied to study in their native provinces. The policy was established with the aim of preventing student migration from smaller cities into the larger ones. There was also a requirement for service after graduation in order to provide deprived areas with education and health.

Validity

The term 'validity' has been defined in testing and assessment as the process of discovering whether a test "measures accurately what it is intended to measure" [7]. Another definition is provided by Henning [8] who defines validity in terms of uncovering the "appropriateness of a given test or any of its component parts as a measure of what it is purposed to measure".

Bachman states that the main goal of validity is to "consider the relationships between test performance and other types of performance in other contexts"[9]. Although a number of assessment specialists such as Hughes [7] believe that validity can be categorized under four main sections of 'content validity', 'construct validity', 'face validity', and 'criterion-related validity', Bachman [9] argues that such a classification is traditional and validity should be considered as a unitary concept. He refers to Messick [10] in this regard, who states:

"An integrated evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences and actions based on test scores".

However, this unification does not mean that each and every category cannot be evaluated in its own right. In fact, different types of validity should be evaluated and the results be unified to get a clear evaluation of the overall validity of the test. In another part of his book, Bachman also argues:

"...while the relative emphasis of the different kinds of evidence may vary from one test use to another, it is only through the collection and interpretation of all relevant types of information that validity can be demonstrated" [9].

Therefore, the aim of this study was to evaluate the construct validity of Konkoor exam in Iran to cover only an aspect of validity. Hence, care should be taken not to overgeneralize the findings and take construct validity as the overall validity of the exam under study.

Construct Validity

Construct validity, as Bachman [9] suggests, "Concerns the extent to which performance on tests is consistent with predictions that we make on the basis of a theory of abilities, or constructs".

Empirical Studies

In examining the validity of Iran's national university entrance examination (Konkoor) for predicting medical students' academic performance, Farrokhi-Khajeh-Pasha et al. [4] followed the cohort of 2003 matriculants at public medical schools in Iran from entrance through internship. The predictor variables were Konkoor total and subsection scores and high school grade point averages (HS-GPAs). They found that "the Konkoor alone, and even in combination with hsGPA, is a relatively poor predictor of medical students' academic performance, and its predictive validity declines over the academic years of medical school" (p. 60).

In another study carried out by Najafabadi, Najafabadi [11], they employed the well-known and powerful statistical technique, the Bayesian structural equation modelling (SEM), to study the academic success of recent graduates who have studied statistics at Shahid Beheshti University in Iran. They identified six factors that positively impact student academic success in the following order of relative impact (from greatest to least): "Teaching-Evaluation", "Learner", "Environment", "Family", "Curriculum" and "Teaching Knowledge".

In exploring negative wash back of Konkoor in Iranian EFL classes and critiquing different stakeholders' accountability and reproductive/ transformative practices, Mirzaei, Hashemian [12] explored the transformative or reproductive practices different stakeholders undertake in relation to the detrimental impacts of Konkoor. They studied 60 EFL teachers, 319 pre-university students, and 15 parents by using questionnaires, observation checklists, and interviews. The results of their study indicated that Konkoor had significant negative wash-back on the process of teaching and learning. They also suggest that the pedagogical practices of the participants only prolonged the impacts of Konkoor by teaching and learning to the test, "practicing test-taking techniques, and using inauthentic materials".

Methodology

The aim of this study was to compare the students' scores in a TOEFL reading test with their previous performance in the entrance exam (Konkoor).

Participants and Instruments

To carry out this research, 100 university students were chosen as the participants. They were in their first year of university studying English Translation in a university in Tehran, Iran and their ages ranged from 19 to 24 years old and they were chosen from both male and female students.

The instruments used for the aim of this study was the reading comprehension part of a sample TOEFL test taken from ETS website online.

Data Collection Procedure

For the purpose of data collection, first their performance in the entrance exam was collected based on the scores reported by themselves. After collecting the data, the reading comprehension part of a TOEFL test was administered to the participants.

The two sets of data, i.e. TOEFL reading comprehension and Konkoor examination were run for analysis to find the correlation between them. For the data analysis part, the scores a Pearson Correlation procedure was carried out by SPSS software for Windows to find the correlation between the scores.

If the correlation turned out to be positive, it means that the participants' scores in the Konkoor increases as their TOEFL reading comprehension skill increases. On the other hand, a non-significant correlation value between the two sets of scores would show that the two examinations did not correlate with each other.

Results

The results of the Pearson Correlation statistical procedure carried out by SPSS showed that there was a positive correlation between the participants' scores in the two tests, i.e. Konkoor and TOEFL ($p < 0.05$, $r = .985$). To put it in other words, the findings suggest that those who scored higher in the entrance exam also scored higher in the TOEFL exam. The following table shows the results of the Pearson Correlation test (table 1).

Based on the results presented above, the results can be interpreted that the construct validity of university entrance exams is high when compared to a standardized English proficiency exam, in this case TOEFL. Put it simply, where Konkoor results increased, TOEFL reading results also showed an increase.

Table 1. Pearson Correlation

		Konkoor	TOEFL
Konkoor	Pearson Correlation	1.000	.985**
	Sig. (2-tailed)	.	.002
	N	100	100
TOEFL	Pearson Correlation	.985**	1.000
	Sig. (2-tailed)	.002	.
	N	100	100

Discussion

The results of this study are similar with the results of studies done by Sazegar and Motallebzadeh [5] who found that Konkoor proved to have content validity, Alavi [13] who studied the predictive validity of final English exams as a measure of success in Iranian national university entrance exam and found that there was a positive relationship between each of the exams and Iranian national university entrance English exam, and Razmjou [14] who found that some of the basic principles of language testing are not observed in the process of constructing the Konkoor. The methodology and results of these studies are presented in the following paragraphs.

Takallou, Vahdany, Araghi & Tabrizi [15] attempted to investigate the effect of test-taking strategy training on Iranian students' performance on English section of the National University Entrance Examination (NUEE). They assigned 160 fourth grade high school students to control and experimental groups. The experimental group received 8 hours of test-taking strategy training along with samples of the NUEE exams, while control group only practiced the samples of the NUEE exams without being imposed to these strategies. They found that the experimental group outperformed the control group in both high stake test of NUEE and the post-test. Moreover, there was a positive relationship between the participants' general point average (GPA) in their school final exams and their test taking strategy use.

Sazegar and Motallebzadeh [5] investigated the reliability, content and criterion-related validity of one of Konkoor at B.A level. To find out the reliability and validity, they collected a sample of 30 B.A. students who were studying teaching English. The results of their study showed that the reliability index of B.A. entrance exam was .74,

and that majority of the questions derived from English book 3 and one -third of questions were related to the pre-university book. So they concluded that the test proved to have content validity.

In another study by Alavi [13], he attempted to investigate predictive validity of final English exams in predicting success in the Konkoor. He gathered 42 pre-university students from different fields of study. He collected their final English scores from their schools and compared them with the students' scores on the Konkoor. The results of his study showed that there was a positive correlation between them. He also goes on to state that there is no guarantee that those students who grade high in high school and pre-university English exams will grade high in the Konkoor as well.

Razmjou [14] did a content analysis of the Konkoor for English Majors held in 1382. His study had two aims: 1) to analyze the content of Konkoor for English Majors to see if there is any pattern at work in the process of devising such an exam, and 2) to pinpoint and describe the problems with this exam. He found that the validity of the exam was not strongly established due to the large number of shortcomings. The problems found during the analysis showed that the exam was not a standardized one; still some of the basic principles of language testing were not observed in the process of constructing the exam.

Farrokhi-Khajeh-Pasha et al. [4] investigated validity of Konkoor for predicting medical students' academic performance. In fact, they examined the predictive validity of Konkoor scores, alone and in combination with high school grade point averages (hsGPAs), for the academic performance of public medical school students in Iran. They found that the Konkoor alone, and even in combination with hsGPA, is a relatively poor predictor of medical students' academic performance, and its predictive validity declines over the academic years of medical school.

In a study to investigate the test-taking strategies that test takers employed to answer the Iranian National University Entrance Exam for MA in TEFL (INUEMA), Kashkouli, Barati, Nejad Ansari [16] chose 260 undergraduate EFL learners preparing themselves for INUEMA were divided into three groups based on the results of a proficiency test. 80 students were grouped as high-

ability group, 78 participants as low-ability and 88 students as the intermediate group. All groups completed the reading section of INUEMA and the Test-taking Strategy Questionnaire which contained four types of strategies. They compared the three groups with respect to the four types of test-taking strategies they employed. The findings of their research revealed that from among all participants, intermediate group used test-taking strategies more than others. The results of their study also showed that monitoring and evaluation were used significantly more than other strategies, which means that takers relied on their academic reading skills for both specific and general comprehension of the texts using neither their background knowledge nor test-wiseness strategies.

Conclusion

As presented in the results section above, Konkoor and TOEFL scores increased along with each other. Therefore, it can be concluded that when TOEFL is regarded as the criterion to test the construct validity of the Konkoor, the latter shows a good correlation and one can understand that the construct validity of the Konkoor is high enough as that of TOEFL.

Furthermore, it can be claimed that where reading comprehension is concerned, despite the fact that there is only one type of question in Konkoor, i.e. multiple choice items with only one correct choice, compared to a variety item types in the TOEFL exam, there is no significant difference between the two examinations in their construct validity.

To make the final conclusion from the results, the construct validity, defined simply as “the degree to which a test measures what it claims, or purports, to be measuring” [17], of Konkoor is high enough in reading comprehension. However, this does not mean that the other sections of the test are also high in construct validity.

The findings of this study can contribute to the field of entrance exam testing in Iran and other parts of the world. Test creators and administrators can also take advantage of the results of this study for their professional development and creating better tests.

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Influence of air pollution on increase of number of pneumonia cases in Tuzla county

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Abstract

Pneumonia is acute inflammatory condition of pulmonary parenchym caused by viruses or bacteria [1]. 450 million people suffer from pneumonia during one year (7% of world population) and is responsible for death of 4 million. Symptoms of pneumonia are: cough, increased temperature, dyspnea, chest pain in deep breath and increased breathing frequency. Also, significant risk factors for pneumonia are environmental factors confirmed so far: pollution of external and internal environment and professional exposure to harmful consequences and gases. Air in certain urban areas, especially near large industrial complexes and roads is contaminated with a many pollutants and many of them cause pneumonia. The aim of this paper is to determine influence of polluted air on increase of number of pneumonia cases in Tuzla county (T.K.). This retrospective, control research included respondents $n=362$, treated in respiratory clinic for pulmonary disease, university - clinical center Tuzla in period from January 1st 2015 to December 31st 2016. Respondents were patients which were diagnosed with clinical diagnosis during hospitalisation, based on: clinical condition, radiology records of lungs, laboratory tests, (SE, KKS, DKS i CRP) and microbiological results, sputum, aspiration and puncture material. The most frequent cases of pneumonia in Tuzla county are older age group people (mostly men) from 60 to 79 years old. Larger number of pneumonia cases is confirmed in 2016 comparing to 2015. Increased number of pneumonia cases was evident during winter months in tested period when air pollution level is at its peak. High percentage of respondents (86%) anamnesticly confirmed exposure to air pollution. Air pollution in Tuzla county is confirmed as significant risk factor for increase of pneumonia cases, especially in older people.

Key words: air pollution, increase, pneumonia

1. Introduction

Pneumonia is acute inflammatory condition of pulmonary parenchym caused by viruses or bacteria [1]. Bacteria are the most frequent cause, and *Streptococcus pneumoniae* is isolated in almost 50% of cases (2). In older people, viruses make almost one third and in children around 15% of pneumonia cases (3). 450 million people suffer from pneumonia during one year (7% of world population) and is responsible for death of 4 million. Also, significant risk factors for pneumonia are environmental factors confirmed so far: pollution of external and internal environment and professional exposure to harmful consequences and gases. Air in certain urban areas, especially near large industrial complexes, power plants with fossil fuels and roads is contaminated with a many pollutants and many of them cause pneumonia. For assessment of air quality in urban areas the following pollutant matters are being measured: SO, NO₂, NO, floating particles (PM₁₀, PM_{2.5}), CO, ground level ozone (O₃), Pb, benzene (C₆H₆), (C₆H₆), cadmium (Cd), nickel (Ni) and benzo(a)pyrene (C₂₀H₁₂). (4). Particles in air represent each dispersed substance (liquid or solid) with molecular size from 0,1 nm to 0,5 mm. Particles smaller than 10 µm (PM₁₀) can precipitate in bronchi and lungs and cause problems. Particles smaller than 2.5 µm (PM_{2.5}) penetrate in lungs and particles smaller than 100 nm can influence other organs. Other risk factors are important as well such as smoking, immunodeficiency, alcoholism, chronic obstructive lung disease, chronic kidney disease and liver disease (5). Symptoms of pneumonia are: cough, increased temperature, dyspnea, chest pain in deep breath and increased breathing frequency (6). Most guides recommend RTG - scan as golden standard for initial diagnosis of pneumonia with presence of etiological factors including environmental and professional risks.

The aim of this paper is to determine influence of polluted air on increase of number of pneumonia cases in Tuzla county (T.K.).

2. Materials and methods

This retrospective, control research included respondents $n=362$, treated in respiratory clinic for pulmonary disease, university-clinical center Tuzla. Data on number of patients with pneumonia were taken from hospital information system BIS in period from January 1st, 2015 to december 31st, 2016. Respondents were patients which were diagnosed with clinical diagnosis during hospitalisation, based on: clinical condition, radiology lungs scans, laboratory tests, (SE, KKS, DKS i CRP) and microbiological results, sputum, aspiration and punction material. Before involving in testing process, patients were informed about procedure and methodology of research. Data on air pollution for particles and gases ($PM_{2.5}$, SO_2 , CO , NO_2 , O_3) were taken from official web site of Ministry for spatial issues and enviroment protection of Tuzla county in form of monthly and year reports.

3. Result

Egzisting data bases in Bosnia and Herzegovina are health informational systems that provided data from primary, secondary and tertiary level of health protection and data on air quality are taken from Ministry of spatial issues and enviroment protection. Comparative analysis of results on air polluting by particles and gases and number of evident worsenings on respiratory health in Tuzla county showed that the most frequent registered in tertiary level of health protection are: HOPB, pneumonia, astma and lung cancer.

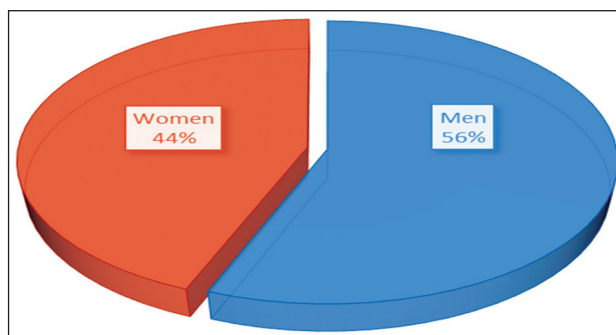


Chart 2. Display of number of pneumonia treated patients according to sex in pulmonary clinic in Tuzla

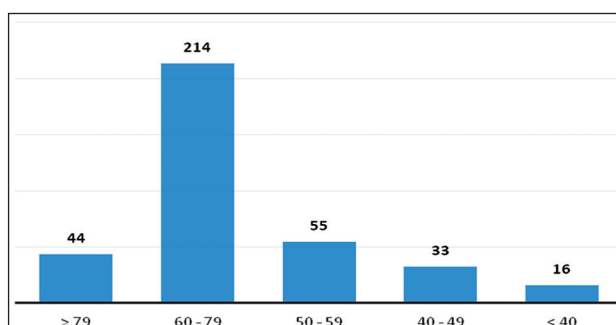


Chart 3. Distribution of pneumonia cases according to age

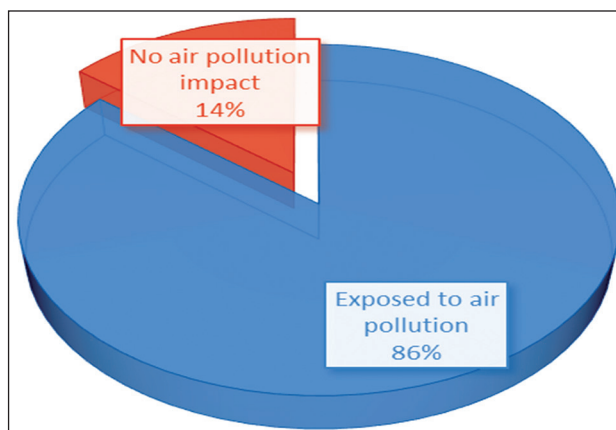


Chart 4. Percentage of exposure of respondents to air pollution

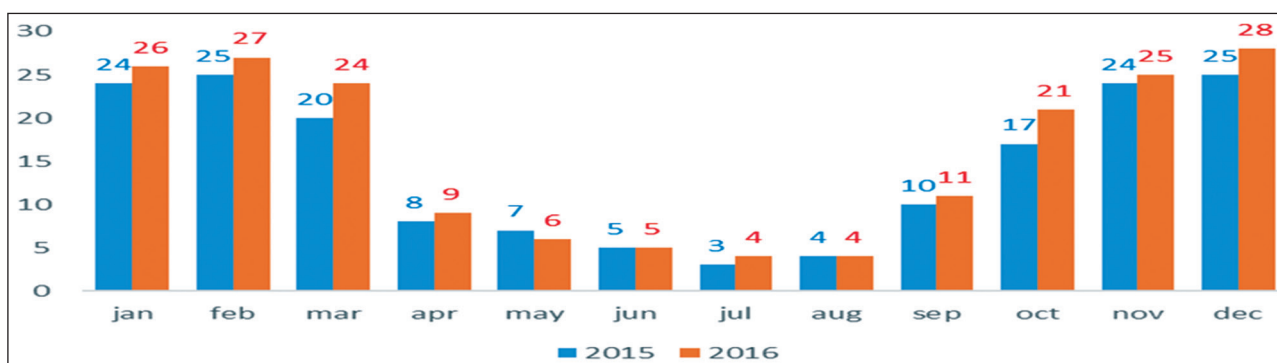


Chart 1. Number of patients diagnosed with pneumonia on monthly basis in 2015 and 2016

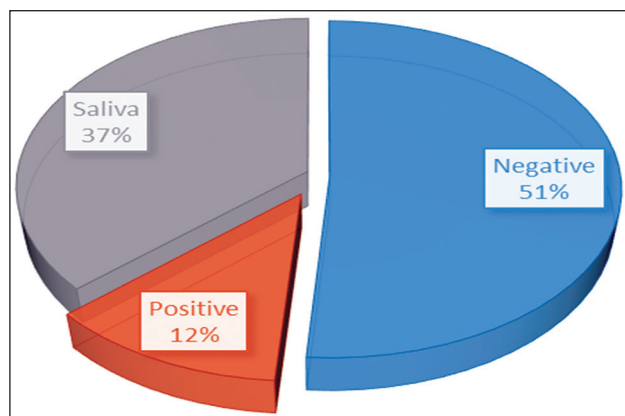


Chart 5. Microbiological analysis of sputum

Limit of pollutant values per year are SO_2 : $50 \mu\text{g}/\text{m}^3$, NO_2 : $40 \mu\text{g}/\text{m}^3$, CO : $3 \text{ mg}/\text{m}^3$ i $\text{PM}_{2,5}$: $25 \mu\text{g}/\text{m}^3$. Comparison of harmful particle values in 2015 and 2016 based on displayed labels indicate significant increase of $\text{PM}_{2,5}$ and SO_2 parameters above. Limited values in winter from October, 1st to April, 30th. During season of heating (increased usage of fossil fuels), while the same values during summer from May to September were in allowed limits.

Descriptive analysis show larger values of harmful particles during winter period in 2016 in comparing to 2015. It can be concluded that

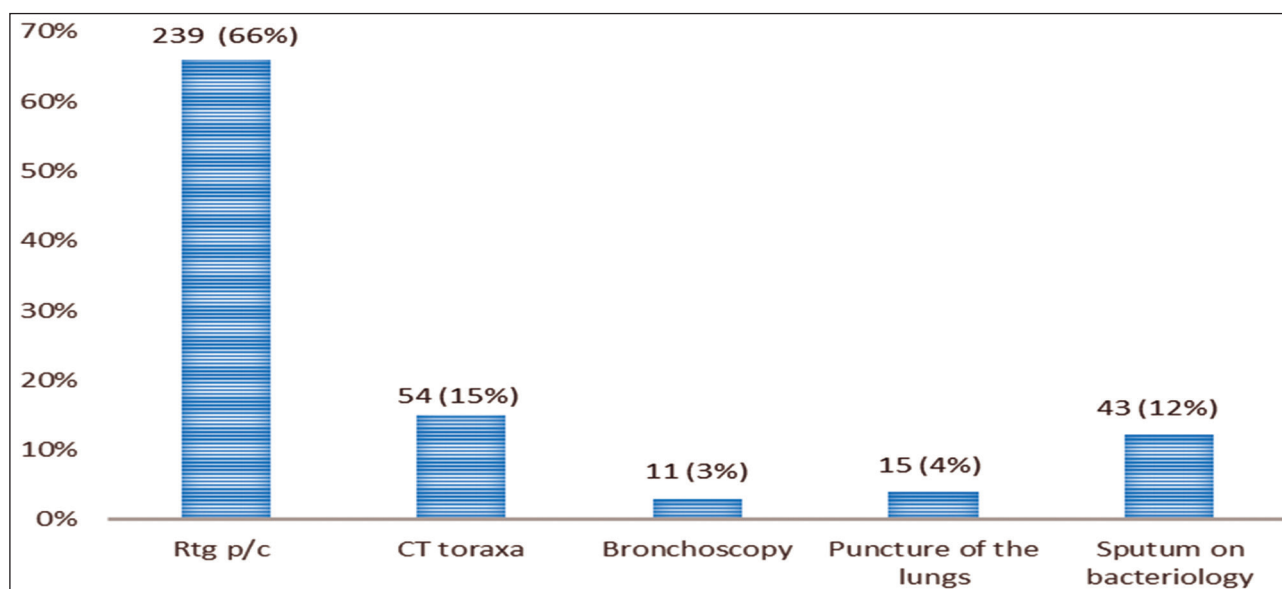


Chart 6. Diagnostical procedures in pneumonia diagnosis determining process

Table 1. Display of average monthly values of pollutants in 2015

Pollutants	Measuring unit	Average according to months in 2015										
		1	2	3	4	5	6	7	8	9	10	11
$\text{PM}_{2,5}$	$\mu\text{g}/\text{Nm}^3$	119,8	65,9	42,3	28,5	21,1	*	21,0	*	*	*	*
SO_2	$\mu\text{g}/\text{Nm}^3$	209,4	117,1	78,7	59,3	26,9	26,0	21,0	33,3	32,9	53,4	73,7
NO_2	$\mu\text{g}/\text{Nm}^3$	47,9	38,9	29,1	24,1	20,5	16,3	32,4	15,3	20,9	23,6	34,1
CO	$\mu\text{g}/\text{Nm}^3$	*	1266	1006	801	855	827	374	1015	1263	2040	2092
O_3	$\mu\text{g}/\text{Nm}^3$	8,1	20,2	12,8	15,6	21,0	32,4	*	46,3	37,2	15,3	12,9

*Analyzers are not in function due to technical problems

Table 2. Display of pollutant average values per month in 2016

Pollutants	Measuring unit	Average per months in 2016										
		1	2	3	4	5	6	7	8	9	10	11
$\text{PM}_{2,5}$	$\mu\text{g}/\text{Nm}^3$	137,3	82,0	42,8	26,3	15,7	17,7	15,0	17,0	16,5	41,2	67,6
SO_2	$\mu\text{g}/\text{Nm}^3$	229,4	139,9	69,7	41,6	19,1	31,1	29,2	23,9	23,3	46,2	70,9
NO_2	$\mu\text{g}/\text{Nm}^3$	53,1	44,9	30,0	21,2	14,0	12,8	13,4	18,3	17,2	25,0	34,5
CO	$\mu\text{g}/\text{Nm}^3$	3119	2368	1000	*	568	634	748	962	1183	1828	1954
O_3	$\mu\text{g}/\text{Nm}^3$	14,0	11,9	17,4	20,4	28,6	45,4	54,6	56,9	36,3	20,2	8,0

*Analyzers are not in function due to technical problems

important role in increased number of pneumonia cases have significantly increased concentrations of harmful particles and gases above allowed values as well as the length of exposition. Other risk factors are also significant. According to statistical data of Ministry of spatial issues and environmental protection in Tuzla county, in december of 2016, Tuzla was one of the most polluted cities in Europe and second polluted city in the world. According to guidelines of WHO, level of SO_2 - $50 \mu\text{g}/\text{m}^3$ presents daily limit that must not be overrun more than 35 days per year, and it is evident that in period from january to october, 2016 there were 600 hours of $50 \mu\text{g}/\text{m}^3$ limit overrunning. One measuring station in Tuzla center had measured more than 700 hours of excessively polluted air in 2016 and according to law regulations only 24 hours of SO_2 and solid particles are tolerant. Older age groups (mostly men) from 60 to 79 years in Tuzla county are diagnosed with pneumonia. Larger number of pneumonia cases is confirmed in 2016 comparing to 2015. Increase of pneumonia cases was evident in winter period, especially in 2016 when level of air pollution is at its peak. High percentage of respondents (86%) anamnesticly confirmed air pollution exposure. The highest number of diagnosed cases was confirmed by lung radiography (66%), CT- scan of thorax - 15%, what confirms that radiology diagnostic represents golden standard in pneumonia diagnosing.

4. Conclusion

Air pollution in Tuzla county is significant risk factor for increase of pneumonia cases, especially in older ones in winter period when presence of air pollutants and gases is most evident. Respecting of „declaration on environment and efforts for health improvement“ for decreasing of pollution source in all sectors: industrial, transport and energetic. Informing of citizens on influence of harmful particles and gases on their health is necessary as well as conducting of safety measures.

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