

Has been issued since 2010. ISSN 2219-8229, E-ISSN 2224-0136.
2014. Vol.(75). № 5-2. Issued 12 times a year
Impact factor of Russian Science Citation Index 2012 – 0,259
Impact factor Index Copernicus 2011 – 5,09

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Journal is indexed by: **Academic Index** (USA), **CCG-IBT BIBLIOTECA** (Mexico), **DOAJ** (Sweden), **Galter Search Beta** (USA), **EBSCOhost Electronic Journals Service** (USA), **Electronic Journals Index** (USA), **Electronic scientific library** (Russia), **ExLibris The bridge to knowledge** (USA), **Google scholar** (USA), **Index Copernicus** (Poland), **math-jobs.com** (Switzerland), **One Search** (United Kingdom), **Open J-Gate** (India), **Poudre River Public Library District** (USA), **ResearchBib** (Japan), **Research Gate** (USA), **The Medical Library of the Chinese People's Liberation Army** (China).

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Postal Address: 26/2 Konstitucii, Office 6
354000 Sochi, Russia

Website: <http://erjournal.ru/en/index.html>

E-mail: evr2010@rambler.ru

Founder and Editor: Academic Publishing
House *Researcher*

Passed for printing 25.5.14.

Format 21 × 29,7/4.

Enamel-paper. Print screen.

Headset Georgia.

Ych. Izd. l. 5,1. Ysl. pech. l. 5,8.

Circulation 1000 copies. Order № 144.

© European Researcher, 2014

2014

№ 5-2

Издается с 2010 г. ISSN 2219-8229, E-ISSN 2224-0136.

2014. № 5-2 (75). Выходит 12 раз в год.

Импакт-фактор РИНЦ 2011 – 0,259

Импакт-фактор Index Copernicus 2011 – 5,09

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Журнал зарегистрирован Федеральной службой по надзору в сфере массовых коммуникаций, связи и охраны культурного наследия (Российская Федерация). Свидетельство о регистрации средства массовой информации ПИ № ФС77-50466 от 4 июля 2012 г.

Журнал индексируется в: **Academic Index** (США), **CCG-IBT BIBLIOTECA** (Мексика), **DOAJ** (Швеция), **GalterSearch Beta** (США), **EBSCOhost Electronic Journals Service** (США), **Electronic Journals Index** (США), **ExLibris The bridge to knowledge** (США), **Google scholar** (США), **Index Copernicus** (Польша), **math-jobs.com** (Швейцария), **Научная электронная библиотека** (Россия), **Open J-Gate** (Индия), **ResearchBib** (Япония), **ResearchGate** (США), **The Medical Library of the Chinese People's Liberation Army** (Китай) и др.

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Адрес редакции: 354000, Россия, г. Сочи, ул. Конституции, д. 26/2, оф. 6

Сайт журнала: <http://erjournal.ru/>

E-mail: evr2010@rambler.ru

Учредитель и издатель: ООО «Научный издательский дом "Исследователь"» - Academic Publishing House Researcher

Подписано в печать 25.5.14.

Формат 21 × 29,7/4.

Бумага офсетная.

Печать трафаретная.

Гарнитура Georgia.

Уч.-изд. л. 5,1. Усл. печ. л. 5,8.

Тираж 1000 экз. Заказ № 144.

2014

№ 5-2

C O N T E N T S

Biological sciences

Tea Mchedluri, Tinatin Khokhobasvili, Shorena Karenashvili, Natalia Dalakishvili Composition of Heavy Metals in the Water of the River Lopota and Floating Silt	928
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Engineering sciences

M.A. Othuman Mydin Evaluation of Active Cooling Systems for Non-Residential Buildings	932
M.A. Othuman Mydin Significance of Building Maintenance Management Systems towards Sustainable Development	940

Economic sciences

Ensar Mekić, Ali Göksu Implementation of ISO 9001:2008 & Standards for Accreditation at Private University in Bosnia And Herzegovina	947
Muhammed Kürşad ÖZLEN, Nereida Hadžiahmetović A Keyword Analysis for Human Resource Management Factors	962
Muhammed Kürşad ÖZLEN, Nereida Hadžiahmetović The Role of Human Resource Management in Employee Motivation	969

Philosophical sciences

Omomia O. Austin Building a Consonance Between Religion and Science: an Antidote for the Seeming Conflict .	980
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Pedagogical sciences

Elena Bendíková, Lukáš Šmída, Robert Rozim Level of Posture of Pupils in the Age of Elementary Schools	990
Natalia Popovych Role of Creative Activity in the Formation of Professional and Personal Experience of the Future Music Teacher	997

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Published in the Russian Federation
European Researcher
Has been issued since 2010.
ISSN 2219-8229
E-ISSN 2224-0136
Vol. 75, No. 5-2, pp. 928-931, 2014

DOI: 10.13187/issn.2219-8229
www.erjournal.ru



Biological sciences

Биологические науки

UDC 57

Composition of Heavy Metals in the Water of the River Lopota and Floating Silt

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Abstract. Like other small rivers in Georgia, the river Lopota, which is one of the most important left tributaries of the river Alazani, is ecologically less studied. Although, phosphorus - potassium fertilizers containing heavy metals from agricultural lands, leaching sediment, composts made of municipal and household waste are systematically leached into the river Lopota, the composition of heavy metals, copper, zinc, iron, lead, nickel, manganese is lower than it is accepted. This fact is promoted by water pH, under which these metals are hydrolyzed and their main mass is accumulated at the bottom, and the rest of it is absorbed in the floating silt. Therefore, they cannot have a negative impact on self-scouring and ecological condition of the river.

Keywords: the river Lopota; heavy metals; floating silt.

Introduction.

Georgia is very rich in fresh water resources. Unfortunately, the quality of water in surface objects does not correspond with the European norms. The pollution of reservoirs threatens the uniformity of bio variety and eco-system, as well as the human health. Heavy metals are among the existing numerous harmful wastes, the compositions of which reach the threatening limit. Their small composition can also have a toxic impact. Under the influence of natural processes they can be transformed into more dangerous forms. They are characterized by the rigidity in the

environment and destructive effects. Therefore, polluting rivers with heavy metals is a serious ecological threat, which is especially dangerous for small rivers. [1, 2].

99, 4 % of the existing 26000 rivers in Georgia are small rivers. Most of them are short shallow mountain rivers. Their average length is 2,3 km. Proceeding from that, ecological monitoring and keeping the environment clean is very important.

The river Lopota is the left tributary of the river Alazani which is one of the most important rivers of western Georgia. The river Alazani takes its source from the south slope of the Caucasus (2560m high). Like other Georgia's small rivers, it is also ecologically less studied [3].

The surrounding territory of the Lopota is tightly populated and is characterized with the developed agriculture, winegrowing, winemaking and cattle-breeding. The Lopota is significantly polluted with the household waste, unfiltered water from local farms and pesticides used in agriculture. Using incorrect methods in agriculture may cause pollution with heavy metals, which will have a serious impact on the ecological condition of the river [4].

Materials and Methods.

Collecting the samples was carried out according to the field research scheme. In order to identify the composition of heavy metals in the river water and floating silt, we monitored seasonally in 2013-14, according to the scheme which was selected in advance and we used corresponding with the research methods. We collected the samples in three control points: Village Lapankuri (point №1), village Napareuli (point №2), and village Saniore (point №3).

Before the field work we planned standard procedures for field analyzes and we tested the apparatuses and reactivities. Collecting and wrapping up the samples were done according to the standard methods [5,6,7].

The samples were collected and stored according to the method which is recommended in the literature of hydrochemistry. The separation of floating particles from water phase was done by filtration with a 0, 4 mmk diameter membrane filter. After this the separated particles were dried until they were transformed into soft- dry mass. In addition ground and bottom sediments were gathered within 50cm. The mass method was defined and samples were stored in biux. The composition of heavy metals was defined with an atomic-absorbing method.

Results and discussion.

2013-14- year results show (Figure №1,2), that in the water of the river Lopota the lowest index of composition of dissolved iron, copper, zinc, lead, nickel and manganese was fixed in Lapankuri, but the highest was found in Saniore. The results of the research show that the pollution is low in the source and upper part of the river, while the composition of heavy metals grows alongside the flow, but it does not exceed the accepted limit.

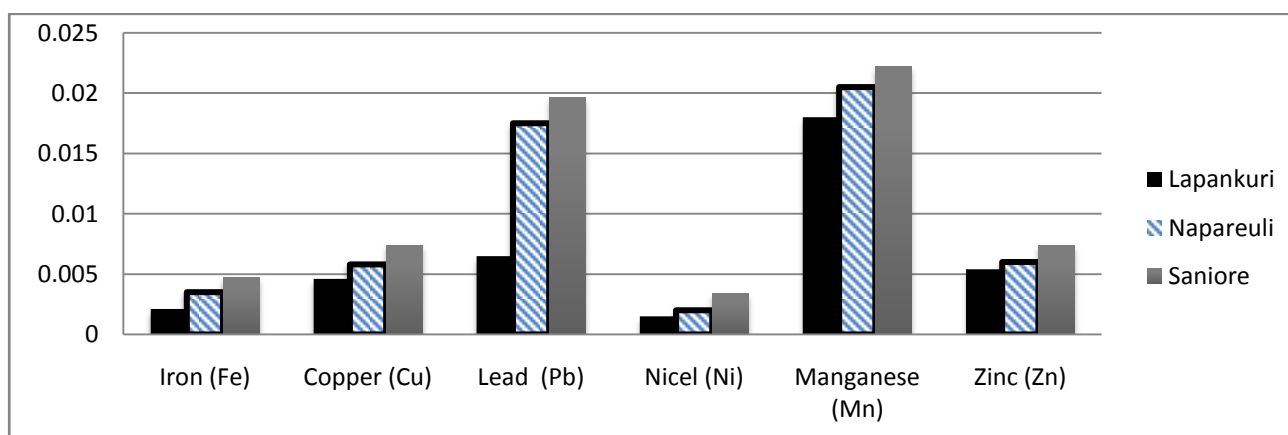


Figure 1. Composition of heavy metals in the water of the river Lopota

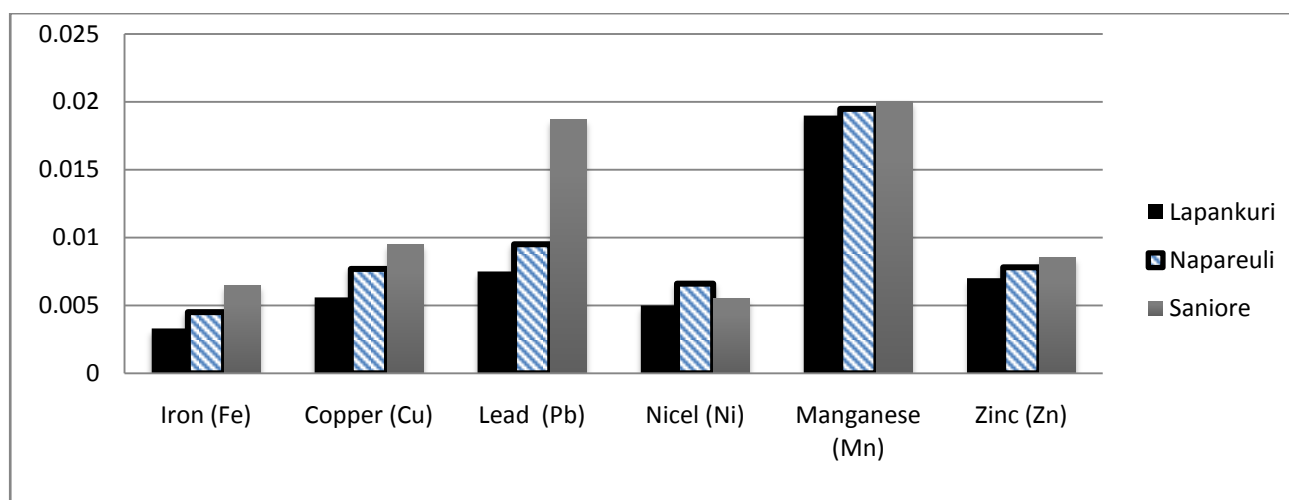


Figure 2. Composition of heavy metals in the water of the river Lopota

In order to estimate the eco-toxic condition of the river Lopota we also studied the composition of heavy metals in the floating silt. The results of 2013 monitoring showed (chart №4) that the composition of copper, nickel, and zinc in the floating silt of the river Lopota is the lowest in Lapankuri and it equals 0,0170 mg/l; 0,0070 mg/l; 0,0240 mg/l, but the composition of copper (0,0340 mg/l) and manganese (0,0265 mg/l) is the highest in Napareuli. Composition of nickel (0,0090 mg/l), lead (0,0080 mg/l), zinc (0,0440 mg/l) and iron (0,0242 mg/l) is the highest in Saniore.

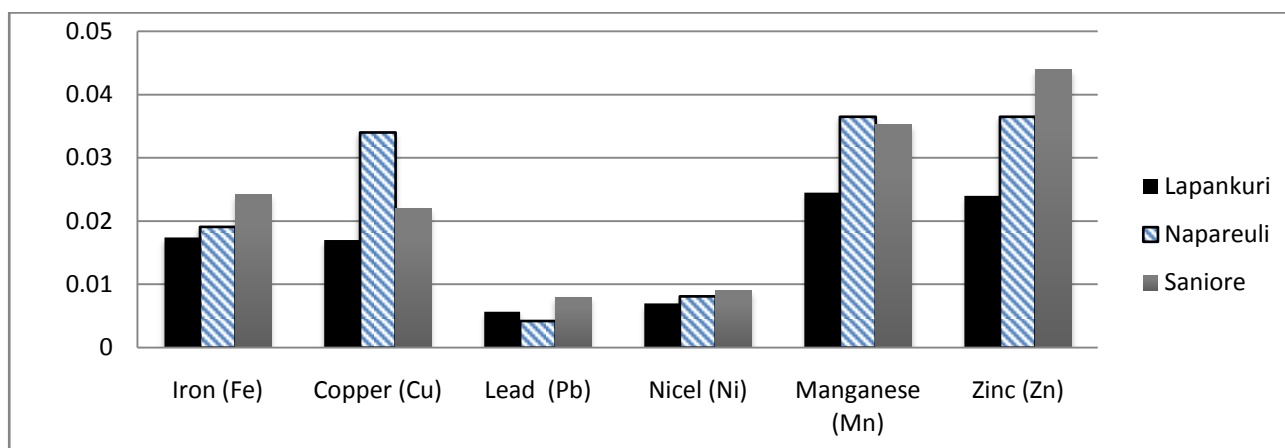


Figure 3. Composition of heavy metals in the floating silt in the river Lopota

According to the research done in 2014 (Figure 4), the highest index of copper (0,0415 mg/l), nickel (0,0088 mg/l) and manganese (0,0386 mg/l) was fixed in Napareuli, but in Saniore – iron (0,0302 mg/l), lead (0,0087 mg/l) and zinc (0,0480 mg/l). As for the low index of iron (0,0195 mg/l), nickel (0,0085 mg/l), zinc (0,0255 mg/l), lead (0,0055 mg/l) and manganese (0,0260 mg/l) was fixed in Lapankuri.

The samples were collected on the territory of tightly inhabited points. The points that were chosen for the research are characterized with developed agriculture, cattle breeding and industry. Because of this the river Alazani is substantially polluted with household used water, unfiltered water leaching from local farms and pesticides that are used in agriculture.

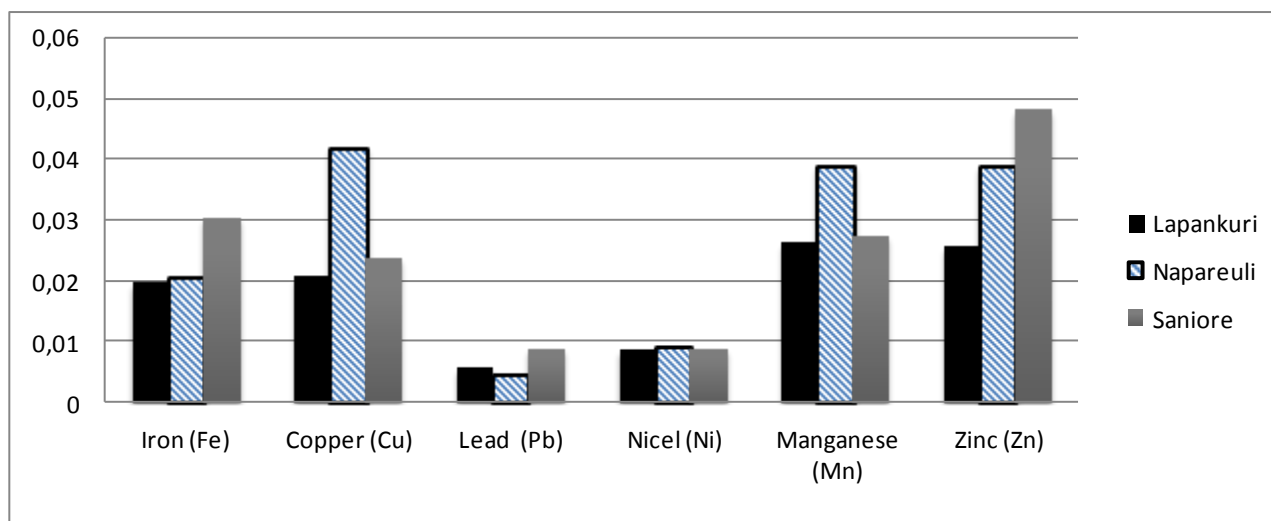


Figure 4. Composition of heavy metals in the floating silt of the river Lopota

Conclusion.

Although, phosphorus – potassium fertilizers from agricultural lands containing heavy metals, leaching sediment, composts made of municipal and household waste are systematically leached into the river Lopota, the consistence of heavy metals, copper, zinc, iron, lead, nickel, manganese is lower than it is accepted. This fact is promoted by water pH, under which these metals are hydrolyzed and their main mass is accumulated at the bottom, and the rest of it is absorbed in the floating silt. Therefore, they cannot have a negative impact on self-scouring and ecological condition of the river.

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Published in the Russian Federation
European Researcher
Has been issued since 2010.
ISSN 2219-8229
E-ISSN 2224-0136
Vol. 75, No. 5-2, pp. 932-939, 2014

DOI: 10.13187/issn.2219-8229
www.erjournal.ru



Engineering sciences

Технические науки

UDC 69

Evaluation of Active Cooling Systems for Non-Residential Buildings

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Abstract. Cooling systems are an essential element in many facets of modern society including cars, computers and buildings. Cooling systems are usually divided into two types: passive and active. Passive cooling transfers heat without using any additional energy while active cooling is a type of heat transfer that uses powered devices such as fans or pumps. This paper will focus on one particular type of passive cooling: air-conditioning systems. An air-conditioning system is defined as controlled air movement, temperature, humidity and cleanliness of a building area. Air conditioning consists of cooling and heating. Therefore, the air-conditioning system should be able to add and remove heat from the area. An air-conditioning system is defined as a control or treatment of air in a confined space. The process that occurs is the air-conditioning system absorbs heat and dust while, at the same time, cleaning the air breathed into a closed space. The purpose of air-conditioning is to maintain a comfortable atmosphere for human life and to meet user requirements. In this paper, air-conditioning systems for non-residential buildings will be presented and discussed.

Keywords: active cooling; air-conditioning; air movement; humidity; thermal comfort; split unit.

Introduction.

Heat always moves from a hot place to a cooler place (Figure 1). Because the heat energy moves from a warm to colder area, during this process the hotter area becomes cool and the cold place becomes warm. Heat is transferred into a mechanical air-conditioning system through the process of cooling water. A refrigerant vapour is passed through a coil and immersed in a container full of water. Heat is transferred from the refrigerant to the water through the walls of the loop [1]. In the air cooling process, refrigerant vapour is passed through the loop and cooled by a fan. The fan blows air across the coil and brings the cold air from the refrigerant vapour into the air releasing heat through the walls of the loop. This process is referred to as heat transfer.

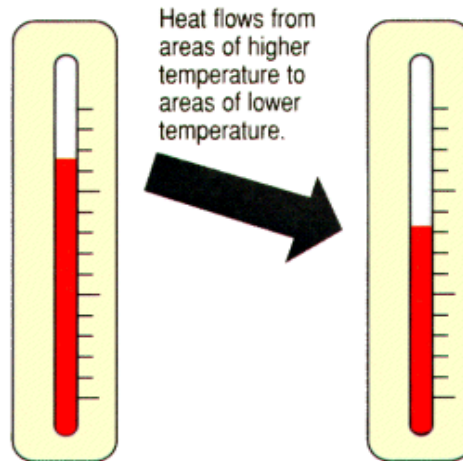


Figure 1. Heat Moves from Higher Temperatures to Lower Temperatures [1]

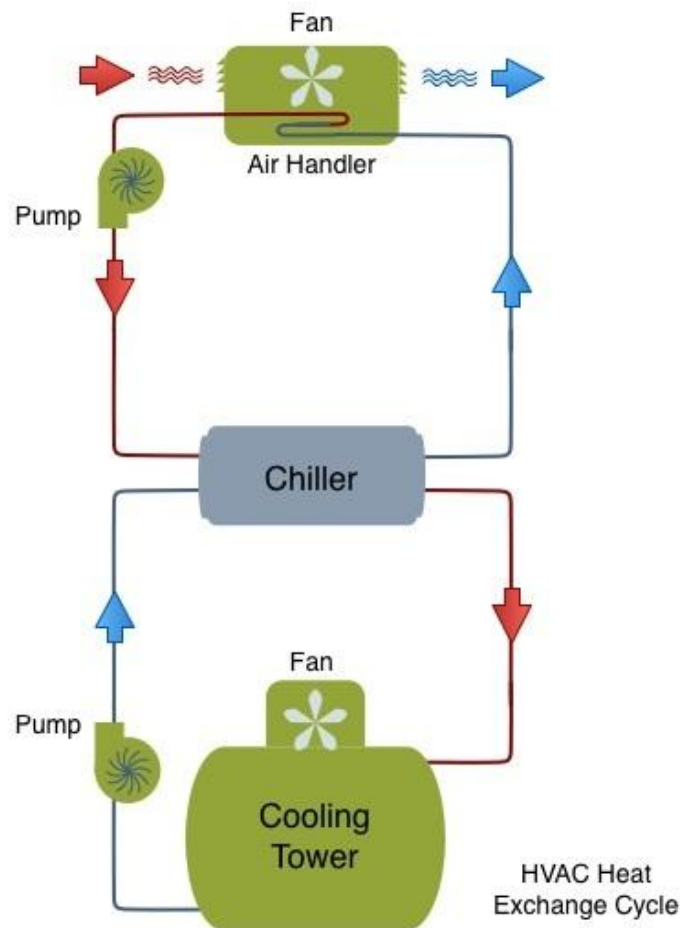


Figure 2. Heat Exchange Cycle [3]

Heat transfer can be done in three ways which are radiation, convection and evaporation. Radiation means heat is radiated through a space with no need for a medium of delivery. The movement of heat energy through electromagnetic waves means no medium is needed to move. Infrared radiation heat is greatly transferred in sunlight. Convection is actually the movement of a mass or volume of fluid or gas from a hot to a cold region [2]. Fluids or hot gases will lightly rise up, begin to cool, gain more weight, and then drop down. Various control cycles need to be done to create comfort conditions that fit the requirements of the user. The fields of refrigeration and air-

conditioning are related to one another, but each one has its own purpose [3]. The main use is for cooling systems and cooling processes. This cooling process is used in the air-conditioning system to cool the air. However, air conditioning is not only for cooling, it also includes heating (Figure 2), cleaning, and air distribution to achieve a base from which reconditioning requirements are met.

Air-Conditioning Systems for Non-Residential Buildings.

Air-conditioning systems are installed in buildings depending on several factors. The system must be capable of cooling and generating enough heat to properly cool or heat the entirety of the enclosed area [4]. These main types of air-conditioning are separated into categories and usually depend on the system's capacity and design, as well as on the system's heat transfer mechanism. In general, for non-residential buildings, air-conditioning systems can be categorized in several ways as shown in Figure 3.

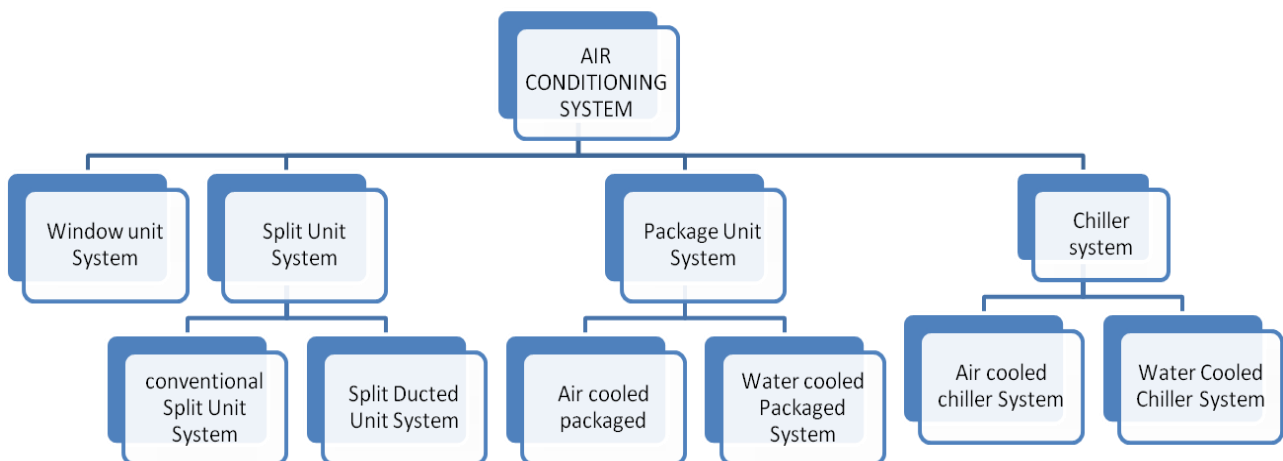


Figure 3. Categories of Air-Conditioning Systems Typically Installed in Office Buildings [4]

Split Ducted System.

A split ducted system is similar to a conventional split system unit but the indoor unit's fan will distribute the cold air into certain spaces. A fan coil unit blows conditioned air into spaces through ducting and diffusers and is usually installed in a small room in a building as a central cooling system. A split ducted system requires its own separate control system. Figure 4 shows a common split ducted system for a house.



Figure 4. Common Split Ducted System for a House [4]

Conventional Split Unit System.

Conventional split unit systems have two parts: an outdoor unit and an indoor unit. The outdoor unit houses components like a compressor, condenser and expansion valve. The indoor unit is comprised of an evaporator or cooling coil and a cooling fan (Figure 5). These systems are sometimes known as multi-split systems and there can be more than one indoor unit per system. Normally, they are installed in a small space and require individual control of the air-conditioning system.

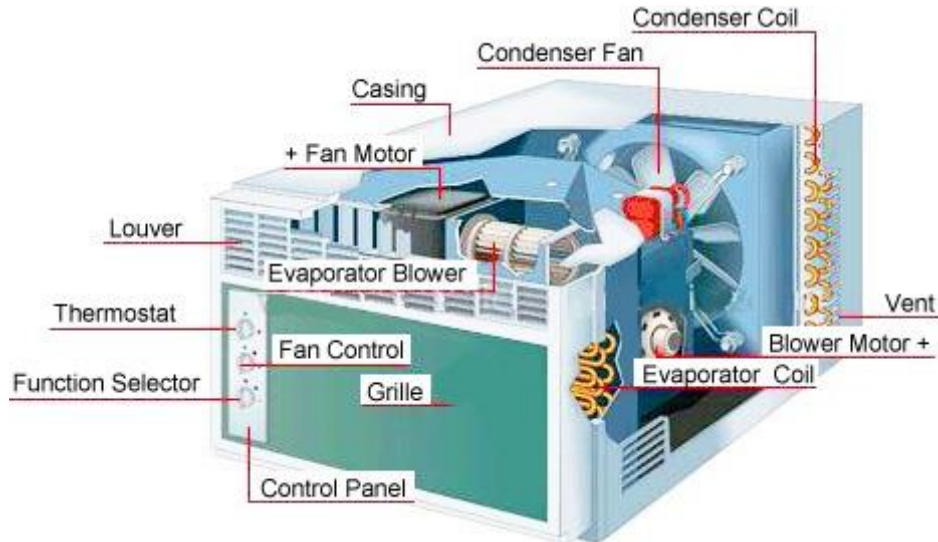


Figure 5. Conventional Split Unit System [4]

Air-Cooled Packaged System.

In a packaged air-conditioning system, all the important components of the system are enclosed in a single casing, like a window unit. Thus, the compressor, cooling coil, air handling unit and air filter are all housed in a single casing and assembled at the factory. The condenser of the refrigeration system is cooled by atmospheric air. This system is also installed as a centralized air-conditioning system in small buildings with the cooling unit comprised of an expansion valve, evaporator, an air handling blower and filters are located together with the compressor outside the building (Figure 6). From outside, the conditioned air is blown through ducting to the various spaces that are to be cooled [5].

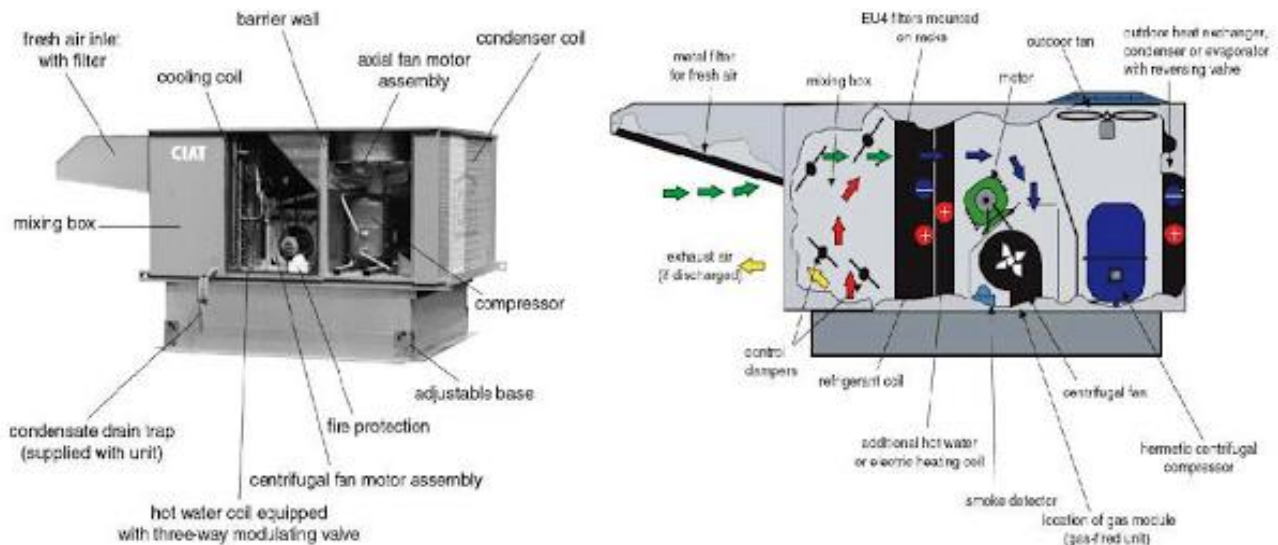


Figure 6: Air-Cooled Packaged System [5]

Water-Cooled Packaged System.

The shell and tube type of condenser is compact in shape and is enclosed in a single casing

along with the compressor, expansion valve, and air handling unit including a cooling coil. This whole packaged air-conditioning unit looks like a box with the control panel located on the outside [5]. The air handling unit is made up of a centrifugal blower and air filter which is located above the cooling coil (Figure 7). The centrifugal blower has the capacity to handle large volumes of air required for cooling a number of spaces.



Figure 7: Water-Cooled Packaged System [5]

Water-Cooled Chiller System.

The main feature of this system is the use of cooling water from the cooling cycle to chill the surrounding air. It has four separate rounds to conduct heat from the cooled space to indoor air. This system operates with cold water which is processed into the chiller system and distributed to several air handling units. Similar to an air-cooled chiller system, this system is generally used for large capacity applications. Figure 8 shows the schematic cycle of a portable water-cooled chiller system.

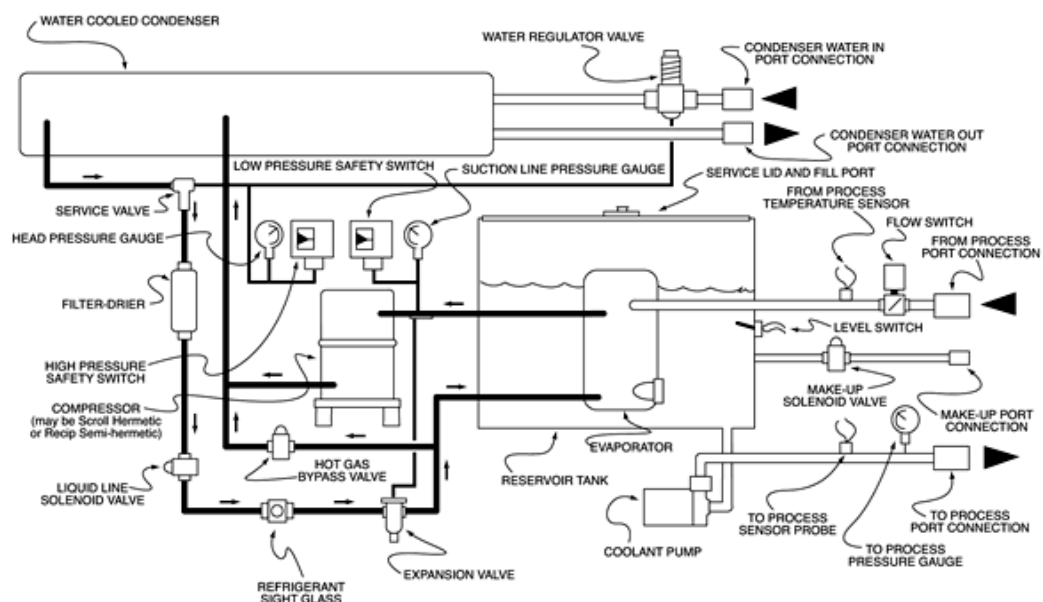


Figure 8. Portable Water-Cooled Chiller System [5]

This type of system is more suited to areas with good sources of water and where the client requires optimum power consumption [6]. The chiller is a system that absorbs heat from one process

and then transfers it to a separate water source such as a cooling tower. This system consists of six major parts: chillers, chilled water pumps, condenser water pumps, a cooling tower, an air handling unit and a control panel [7]. Figure 9 is an example of an industrial water-cooled chiller system.



Figure 9. Industrial Water-Cooled Chiller System [6]

Air-Cooled Chiller System.

Air-cooled chiller systems are usually installed in large buildings for the comfort of the buildings' occupants. Moreover, this system requires less maintenance and can increase management efficiency. The air handling unit supplies conditioned air to spaces through ducts and diffusers while warm air in these areas is then drawn back into the air handling unit through return air grills and ducts [7]. Figure 10 demonstrates a common air-cooled chiller system loop.

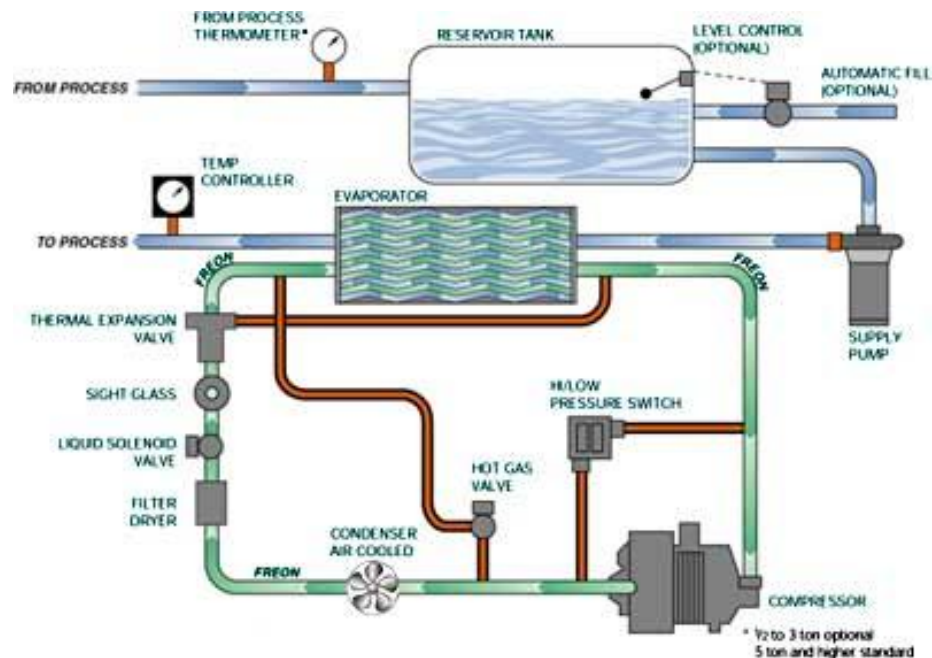


Figure 10. Common Air-Cooled Chiller System Loop [7]

Here, chillers transfer heat from processed water (*return chilled water*) to the surroundings. An air-cooled chiller consists of a compressor, evaporator, blower fan, chilled water pumps, control panel and condenser. These are all housed together as a package that supplies chilled water to the air handling units located in various floors or locations [7].

Thermal Comfort for Office Buildings.

Thermal comfort is best defined as a subjective condition of mind which expresses satisfaction with the surrounding thermal environment [3]. The environmental conditions required for comfort are not the same for each person. Because of this, when a space is occupied by a group of people, it is not feasible to satisfy everyone's thermal comforts due to differences in their physiological and psychological needs [8]. Thermal comfort is heavily influenced by the level of comfort that is considered suitable for humans and it is also influenced by environmental factors. Therefore, thermal comfort is actually too abstract because it depends on each individual. Figure 3 demonstrates how our bodies exchange heat with the thermal environment.

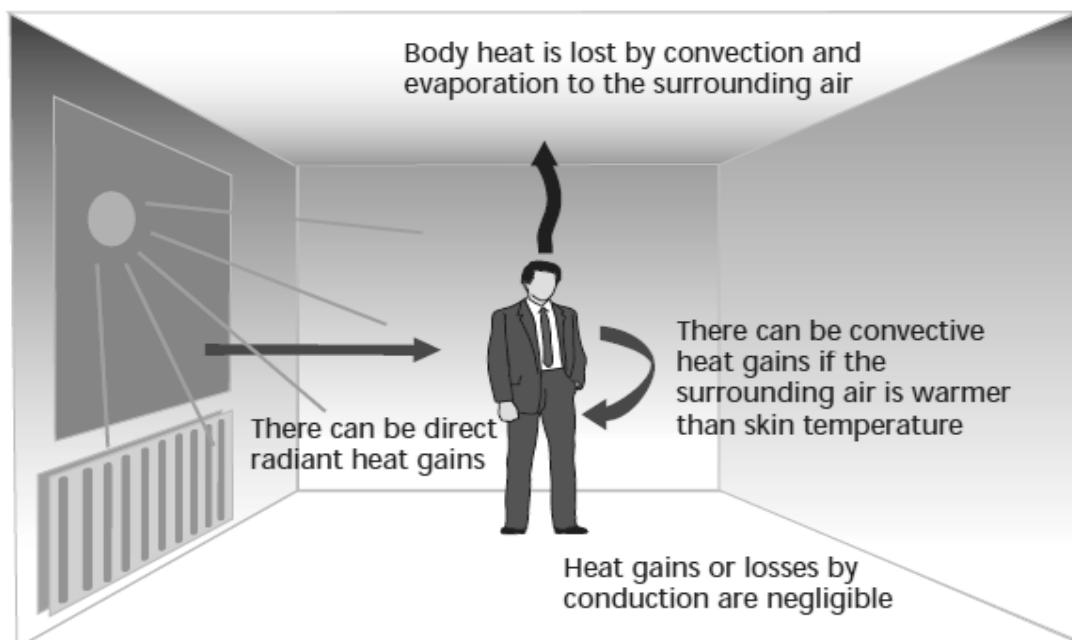


Figure 3. Exchange of Body Heat with the Thermal Environment [8]

While every individual has different levels of comfort, air-conditioning systems are becoming more and more common in buildings. The energy consumed by air-conditioning systems is a matter of key concern for those involved in the design and operation of buildings. Energy consumption, building sustainability and occupant comfort are interrelated and highly dependent on the provision of good indoor environmental comfort. As a result, an adaptive approach to thermal comfort based on the natural tendency of humans to adapt to the changing conditions of their environment, has been proposed [9].

Air Temperature.

While there are a number of thermal comfort variables, one which is equally important is air temperature. It is defined as the average temperature of the air surrounding an occupant. In this research, the value of air temperature is measured in Celsius. It is also often referred to as dry and wet bulb temperature.

Metabolic Rate.

Metabolic rate refers to the transformation rate of chemical energy into heat and mechanical work by metabolic activities within an organism. It is usually expressed per unit area of the total body surface such as $\text{Btu/h.ft}^2\text{W/m}^2$ [10]. Metabolic rate varies according to human activity and not to the physical environment. It is the key variable in thermal comfort research and it has been considered safe to assume that constant values for all occupants in one space are the same as their work activity.

Clothing Insulation.

Another variable that greatly contributes to thermal comfort is clothing insulation. As defined by ASHRAE Standards, clothing insulation is an ensemble of clothing that acts to create resistance

to sensible heat transfer of the whole body including the uncovered parts such as face, head and hands. The guidelines are provided for thermal comfort related calculations which are based on insulation values of typical clothing ensembles [10].

Humidity.

Humidity, the moisture content of the air, is yet another variable of thermal comfort. In this research, humidity is measured as relative humidity. Relative humidity below 30 % can result in shocks from static electricity. Ratings below about 25 % can cause eyes and skin to feel dry. Levels above 80 % lead to a sticky and uncomfortable feeling. Such high levels of humidity can also lead to condensation and mould growth on building surfaces. The air can feel very stale and stuffy at high relative humidity.

Air speed

In thermal comfort, air speed is the variable which refers to an average air speed exposed to the occupant's body.

Conclusion.

At present, the majority of office buildings are equipped with adequate air-conditioning systems. It is necessary to maintain the temperature and humidity in the building. Furthermore, in warm and humid climates, worker productivity throughout the year can be indirectly impacted by the effect of the temperature on the indoor environment. Using air-conditioning systems in buildings is one way to maintain the temperature and moisture to ensure the thermal comfort of employees. Therefore, it is important to conduct proper investigations to understand employee reactions to the differences in temperature and humidity their places of employment. Doing such research can greatly improve the performance and design of air-conditioning systems in office buildings.

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Published in the Russian Federation
European Researcher
Has been issued since 2010.
ISSN 2219-8229
E-ISSN 2224-0136
Vol. 75, No. 5-2, pp. 940-946, 2014

DOI: 10.13187/issn.2219-8229
www.erjournal.ru



UDC 69

Significance of Building Maintenance Management Systems towards Sustainable Development

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Abstract. Building maintenance management is an organized and effective system of maintenance operations which is set up to deal with problems related to the upkeep of a building. Its goal, aside from locating and remedying a building's deficiencies, is to effectively minimize the overall costs of maintenance and is also an effort to maximize the gain and benefits from the savings. There are a few factors that influence decisions to undertake maintenance work. The principal goal of maintenance is to protect a building in the early stage of issues as they arise. Some major reasons for maintaining a building include retaining its reputation and value of investments, maintaining the building in a condition which allows it to accomplish its purpose, and presenting a good outer shell. This paper will review and discuss some of the major elements of building maintenance towards achieving sustainable buildings.

Keywords: building maintenance; maintenance management; maintenance technology; sustainable building.

Introduction.

Building owners consider planned maintenance to be a matter that calls for serious apprehension, yet they can't afford to allow their properties to perish over time [1]. As it is undoubtedly not feasible, and even detrimental, to restore all older buildings, everybody is concerned about the condition of older buildings. Whether the owners, builders, or the end users, all involved ought to devote serious attention to this infinite dilemma of building maintenance [2]. Now and then, a certain amount of budget is available to handle or cover problems, but maintenance is instead held off while waiting for the liable party to deal with the issue. In such a situation, progress in building maintenance is waylaid and commotion over the restoration commonly arises [3]. Building maintenance encompasses every aspect of a building, for example, rooms, toilets, windows, walls and furniture. Building maintenance is a worldwide issue and is especially used as a timely corrective measure for damages and structural concerns; which, if not properly taken care of, could undermine the reputation and safety of the structure [4].

The following are specific maintenance objectives: to execute daily housekeeping and cleaning to sustain an appropriately aesthetically pleasing facility, to swiftly react and repair minor discrepancies in the facility, to expand and frequently perform systematically scheduled maintenance checks to avoid untimely failure of the facility and its systems as well as its components, to complete major repairs based on the lowest possible life-cycle cost [5], to

recognize, design and undertake enhancement projects to diminish and curtail the entire building's operating and maintenance costs, to operate the facility's utilities in the most cost-effective way while providing required dependability, to offer a trouble-free and comprehensive system for the reporting and recognition of essential repairs and maintenance work, to perform precise cost estimations to guarantee the most cost effective maintenance problem solutions possible, to keep an appropriate amount of materials and spare parts on reserve for unforeseen repairs, and to accurately track the costs of all maintenance work done [6].

Types of maintenance.

Corrective maintenance is maintenance carried out subsequent to breakdown having occurred and is meant to reinstate an item to a state in which it can execute its intended purpose. Whereas preventive maintenance is maintenance that is carried out at a prearranged period of time and is anticipated to diminish the probability of malfunction or diminished performance for any particular item. Condition-based maintenance is defined as preventive maintenance that is carried out as a result of knowledge of the issue thanks to scheduled or incessant monitoring [7].

It should be pointed out that corrective maintenance is the simplest type of maintenance approach, where building components are utilized until they break down. It covers all actions including repair of an element that has failed to a point at which it can no longer execute its intended purpose. Hence, corrective maintenance can be tremendously costly because the breakdown or failure of particular items can cause significant damage to other elements in the building. For example, failure of the roof might cause harm to the ceiling as well as the interior part of the building. Furthermore, the failure of an item can take place at a time that is equally inconvenient for the user and the maintenance personnel. This could make arrangements for manpower and spare parts exceptionally complicated [7]. Figure 1 outlines the maintenance system life cycle.

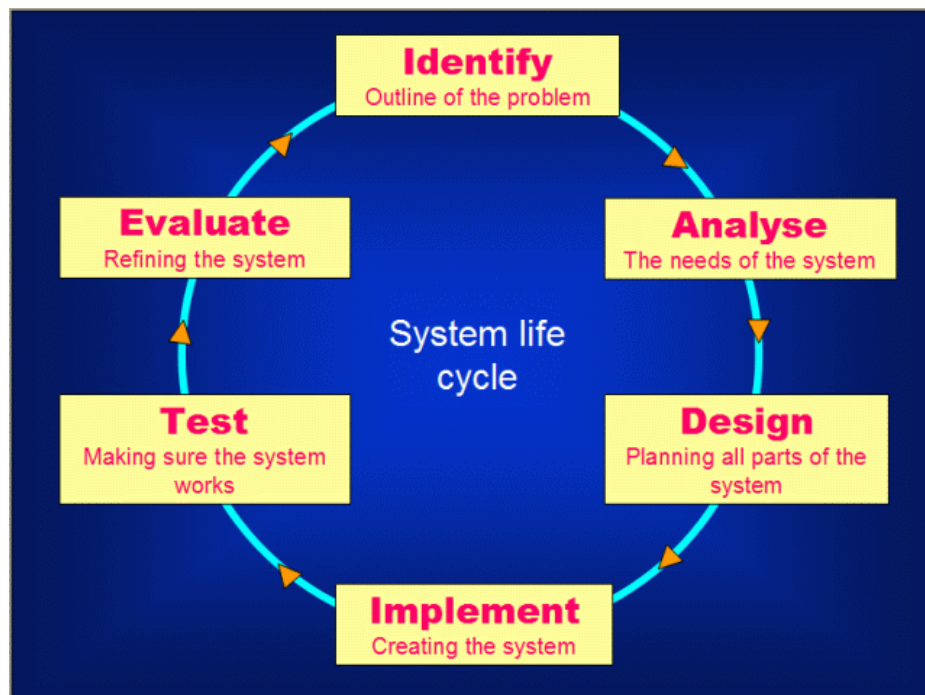


Figure 1. System life cycle [7]

Preventive Maintenance.

On the other hand, preventive maintenance is established to surmount the disadvantages of corrective maintenance by reducing the likelihood of malfunction and avoiding unexpected failure. Preventive maintenance checks are done in agreement with a prearranged plan at regular, fixed intervals, which may be based, for example, on an operating time. There are some additional advantages of preventive maintenance compared to corrective maintenance such as the ability to conduct the maintenance advance and to be executed when it is expedient to the building's users, the expenditure could be lowered by avoiding higher costs of significant damages, the point in time

when a component of the building or the entire building itself becomes out of service can be offset, the health and safety of the users can be improved, and they are less challenging in terms of spare parts and labour costs [8].

The category of preventive maintenance includes checks or upgrades that are programmed or predefined and standard time intervals to ensure continual proper functioning of the components. This type of maintenance can reduce unplanned work and is allotted for in overall costs [9]. Additionally, professional property managers are trained to comprehend that breakdowns of principal components must be prohibited. Preventive maintenance keeps a building operating at peak performance during regular inspection and repair.

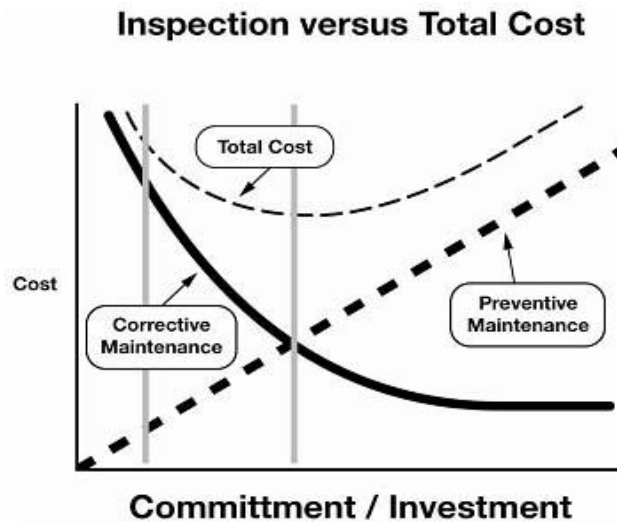


Figure 2. Total Cost broadens with the meeting point of Corrective and Preventative costs, indicating the low point for total cost desired [8]

The intention is to determine minute problems before they turn big and costly according to their cost of maintenance. Preventive maintenance's approach is most suitable for components that are subject to expected damage because they are fragile or easily worn out, their breakdown patterns can be recognized and can be modelled effectively, components that are meticulously synchronized for health and safety reasons, and also components that could be liabilities under the service contract. Figure 2 shows how the total cost broadens with the meeting point of corrective and the preventative costs which indicates the low point for total cost required.

Condition-Based Maintenance.

For condition-based maintenance, maintenance is carried out in reaction to the worsening of a unit as designated by a change in its condition or performance [9]. This notion dictates that an alteration in condition and functioning of an item is the primary grounds for carrying out the maintenance. As a result, an optimal time is required in order to execute the maintenance so that the real state of each component in any particular building can be diagnosed.

It should be pointed out that, for the purpose of gaining the full benefit of using this type of maintenance, the condition of an item needs to be observed carefully in order to spot whether there is any proof of alteration from a normal state to an abnormal one [9]. Figure 3 represents the 'typical' degradation process experienced by any type of equipment. In a certain period of normal operation time, where the item has been running smoothly, a change might occur which will affect overall performance.

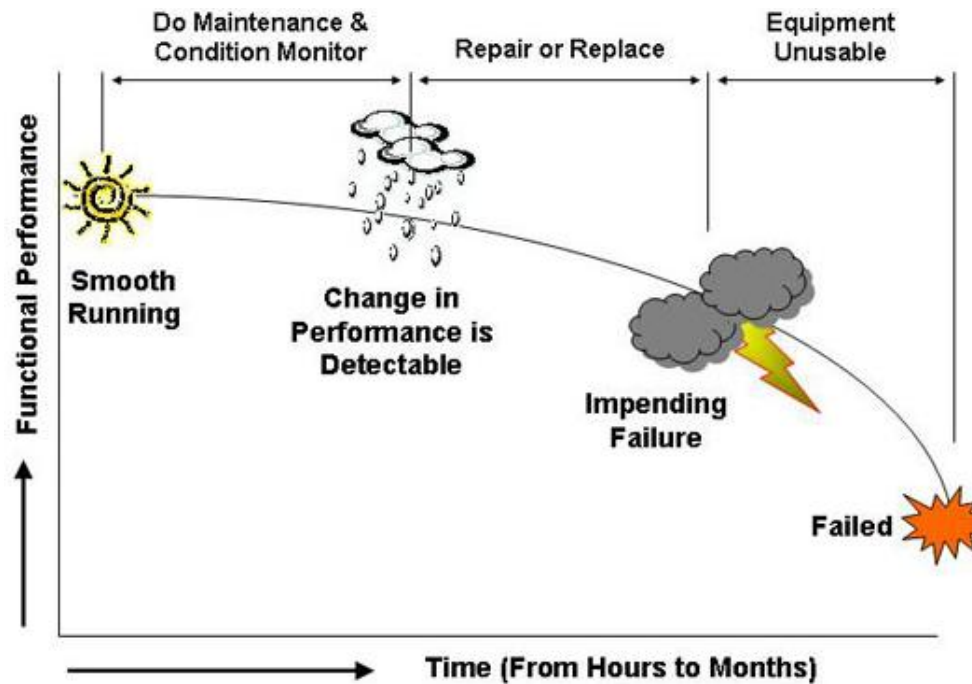


Figure 3. Typical process of degradation that any type of equipment may undergo [9]

Relationship between Preventive and Corrective Maintenance.

As previously outlined, there are two types of maintenance which are preventive maintenance and corrective maintenance. Preventive maintenance is the routine, regularly scheduled maintenance of a piece of equipment that ensures its continuous use and maximizes its life expectancy. Meanwhile, corrective maintenance is an emergency measure which is carried out after damages or problems have already occurred.

Preventive maintenance is suggested as a means to diminish equipment breakdowns. It is a method that requires a set maintenance programme, but the cost aspect connected with this type of scheduled equipment servicing is small in comparison to the cost of coping with unforeseen and disastrous breakdowns which entail not only main repairs but even the replacement of expensive components or even the entire system [2]. Figure 4 shows the difference between preventive and corrective maintenance.

According to Figure 4, preventive maintenance is better in comparison with corrective maintenance because the advantages of taking precautions towards a building to prevent it from becoming worse outweigh those of doing renovations or repairs after damages have already occurred. The cost of corrective maintenance is also more expensive compared to the cost of preventive maintenance. This is because preventative maintenance allows for low cost ways of preventing problems before they become exponentially more expensive, serious damages.

Preventive maintenance notably more advantages over those of a corrective maintenance program. The advantages of preventive maintenance are that it can increase a component's lifecycle and can reduce component failure. Additionally, it allows for possible energy savings estimated at 12-18 % cost savings in contrast to corrective maintenance. On the other hand, corrective maintenance incurs less short-term costs and requires fewer staff since less work is being done [10].

In terms of the disadvantages of corrective maintenance, it could increase long-term costs due to unplanned equipment downtime and probable derivative equipment or procedure damage. Though superior, preventive maintenance also has some disadvantages. It can be labour intensive and some breakdowns are still likely to occur despite carrying out preventive measures. It may also lead to the execution of needless routine maintenance because of the predetermined maintenance schedule [10].

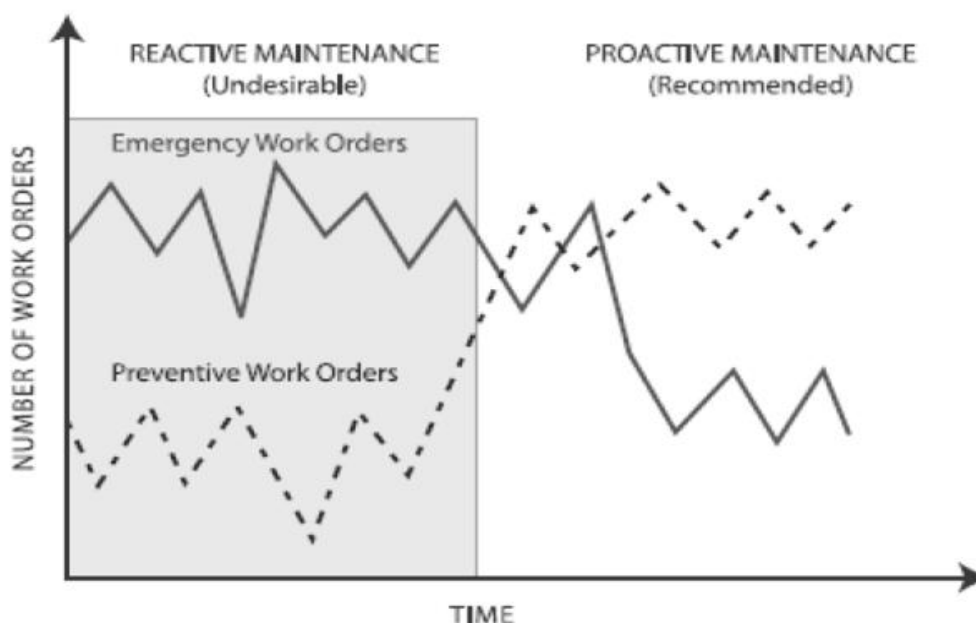


Figure 4. The difference between preventive and corrective maintenance [11]

Building maintenance performance.

Maintenance performance indicators are utilized to assess the efficiency of undertaken upkeep. Maintenance performance indicators could be used for financial reports, monitoring the performance of employees, customer contentment, environmental health and safety ratings, overall equipment efficiency, as well as many other applications. If maintenance performance indicators are recognized correctly, then maintenance performance can offer or recognize resource allocation and control, problem areas, maintenance contribution, benchmarking, personnel performance, as well as the contribution to maintenance and overall business objectives [11].

It should be noted that all these parameters set the limitations to which the maintenance management system should be contained. For example, a building evaluation system is utilized for the pre-occupation of public office buildings in Malaysia which focuses on particular building components, services and also noise contamination and shuddering [7, 8, 9].

Maintenance work.

Generally, the three types of maintenance work are normal work, urgent work and emergency work. These types of work are applied according to the type of failure and the action time. One to three weeks are taken for ordinary work, whilst for jobs requiring fast attention, the action taken is less than one week. Immediate action for emergency work must be taken in one to two days. The categories of maintenance for various types of work are described as follows:

Work Service.

Cleaning services fall into the category of work service for their facilities and equipment. These services require scheduling and should be conducted in accordance with priorities as well as with the routine of the equipment or facilities that need to be maintained. Quantity of services is dependent on size range and number of units or tasks in a building. The larger the size and coverage of the equipment, the more service jobs required, and vice-versa. Examples of such types of this work include machines, windows, floors and others [12].

Repair Work.

Repairs carried out to address failures and defects of the facility and equipment building covering incompatibility methods and materials used in construction. Thus, appropriate services focus on the early stages after construction is completed. Urgent repairs can reduce more frequent maintenance requirements in the future. Repair work implemented based on complaints and

consumer reports or by the owner about damaged building components, pumps, tiles, lighting damage, air conditioning and so on affect the comfort of many [13].

Replacement Work.

All materials, components and equipment for a building face differing levels and rates of damage influenced by their quality, the environment, and frequency of use [14]. Thus, replacements can be used to ensure that each item is replaced at the proper time if a corrective action cannot be made. Scheduled inspection should be done routinely for each recorded items with the intent of identifying failures and damage. Replacements can prevent adverse effects on performance and the overall function of the building. Among the items that are considered to be the main lifeline of a building and which, therefore, must be observed are structural components, mechanical components, electrical and water systems [15].

Work Protection.

Protection involves work aimed at controlling functions, including the appearance of a building's performance. Protection should be given throughout the life of the building as the building is vulnerable to damage and defects caused by factors such as weather, frequency of use, and others. Protection can avoid defects and more serious damage in the future. It can also guarantee the resistance of each component during use. For example, exterior surfaces of buildings can be painted to control the effects of weather and fungal attack [15].

Conclusion.

This paper has comprehensively examined dominant theories on maintenance and it will help future researchers become acquainted with relevant maintenance issues. It should be pointed out that building maintenance management is an organized and effective system of maintenance operations which is set up to deal with problems related to the upkeep of a building. Its primary purpose, apart from identifying and remedying damages in a way that minimizes maintenance costs, is to enhance the overall value of the investment. There are many factors that influence the decision to perform maintenance on a building, but the major intention of maintenance is to protect a building in its preliminary stage and to retain the value of investments in the property. Keeping the building in a condition in which it continues to fulfil its purpose and making sure it presents an attractive exterior are also important factors made possible through proper building maintenance.

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Published in the Russian Federation
European Researcher
Has been issued since 2010.
ISSN 2219-8229
E-ISSN 2224-0136
Vol. 75, No. 5-2, pp. 947-961, 2014

DOI: 10.13187/issn.2219-8229
www.erjournal.ru



Economic sciences

Экономические науки

UDC 33

Implementation of ISO 9001:2008 & Standards for Accreditation at Private University in Bosnia And Herzegovina

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Abstract. Main objective of this work is to provide empirical evidence that implementing ISO 9001:2008 and standards for accreditation required by Agency for Development of Higher Education and Quality Assurance (HEA) is good way to achieve success on the way to improve quality of higher education institution. In analytical part of this paper, mainly descriptive statistics will be used since issue is related to presenting results of measurements conducted by institution over years. List of HEI's (higher education institutions) indicators of quality will be analyzed over years in order to compare institution's performance over years after implementing of ISO 9001:2008 and standards for accreditation required by HEA. Data was collected through annual and semiannual reports of HEI conducted from 2009 to 2014. After comparative analysis of data over years, trend line is obvious in following all quality indicators which is great empirical evidence that implementation of ISO 9001:2008 and accreditation standards required by HEA are good way to improve quality of HEI. Main contribution of this work to science is empirical evidence that implementation of ISO 9001:2008 and accreditation criteria of HEA leads to increase of quality at institution level. Also, it is good stimuli for future research, and it provides potential idea of integrating ISO 9001:2008 and accreditation criteria with aim to create unique quality model for HEIs in Bosnia and Herzegovina.

Keywords: ISO 9001:2008; accreditation; Agency for Development of Higher Education and Quality Assurance (HEA); higher education institution (HEI).

Introduction.

Lack of domestic literature regarding quality in higher education, along with increase in number of private Higher Education Institutions in Bosnia and Herzegovina (B&H) resulted in a need for researching and writing more about this issue. Fact that this paper is writing about Higher Education Institution (HEI) Star, which is young and operating in highly competitive market, and

that it needs not only well implemented ISO 9001:2008, but also standards for accreditation, provides a reason more for selecting this title.

There are three main reasons that give huge importance to this work: First reason is directly related to fact that B&H participate in Bologna process. As stated above, this work is not only important for HEI Star, but also for all other higher education institutions located in B&H. This country is one of the forty seven states participating in the process of creating the European Higher Education Area (EHEA), or Bologna process in other words. It became full member state of the Bologna process since 2003. The main objective of the Bologna Process since its inception in 1999, the EHEA was meant to ensure more comparable, compatible and coherent systems of higher education in Europe (Romanian Bologna Secretariat, 2010). On the way of Bologna, it is extremely important for all participating HEIs to implement ISO 9001:2008, and ENQA standards not only in order to stay competitive, but to contribute to development of education and realization of main Bologna process' goal. As one of those institutions, HEI Star is definitely obliged to have properly implemented ISO 9001:2008 and ENQA standards. This fact gives even more importance to this paper.

Second reason is related to practical value of this paper since situation will be analyzed based on real data of Star University, and provide to institution valuable assessment not only in terms of quality level, but also in terms of implementation of ISO 9001:2008 and ENQA standards. Since this kind of assessment was not previously done in this institution, this work may be the first document of this type.

Third reason is related to accreditation process of HEIs in B&H which is ongoing in academic 2013/14. In fact, Agency for Higher Education Development and Quality Assurance in B&H (HEA) is conducting accreditation process and provided nine criteria to implement. Seven of those criteria are actually ENQA standards provided by European Association for Quality Assurance in Higher Education. Therefore, this paper is important as provider of good preparation plan for accreditation process of not only Star University but all other HEIs in B&H.

Main objective of this work is to provide empirical evidence that implementing ISO 9001:2008, standards for accreditation of HEIs required by Bosnian HEA, is good way to improve quality of HEI, and to make it closer to European Higher Education Area. Specific objectives are to analyze current situation of Star University, to compare situation over years after implementation of ISO 9001:2008 and HEA's standards at Star University.

In analytical part of this paper, comparative analysis based on descriptive statistics will be used since issue is related to presenting results of measurements conducted by institution over years. This paper has two aspects of contribution, theoretical and practical. Theoretical aspect provides contribution for all researchers who want to have insights into ISO 9001:2008 and ENQA in higher education within conditions of Bosnia and Herzegovina. Also, it will contribute in filling the gap in literature when it comes to writing about quality systems in context of implementation in B&H. On the other hand, paper should practically contribute Star University since it will provide empirical evidence of its increase in quality as a consequence of properly implemented ISO 9001:2008 and HEA's standards.

Literature review.

Variety of sources including books, journal articles, conference proceedings, reports, official web pages are used while writing this paper.

Many different definitions of quality are best evidence of its complexity. Therefore, it is not surprisingly that Naomi Pfeffer and Anna Coote (1991) characterized quality as a "slippery concept". They provided several reasons to prove this statement. First one is fact that quality serves different purposes and its meaning changes according to interests that are driving it. Second reason provided by Pfeffer and Coote (1991) is fact that people perceive and experience quality in different ways, and they have different needs and expectations towards it. Third reason is related to outcome of the process of quality assurance which can have infinite number of variables depending on the context. Accordingly, when it comes to definition of quality, authors concluded that it refers to something we all unquestioningly favor (Pfeffer & Coote, 1991). Sallis (2005) mentioned that word quality comes from the Latin *quails* meaning *what kind of*. While explaining quality, he stated that it is an ideal with which there can be no compromise. Quality things are perfect, valuable, with no expense spared and convey prestige to their owners. Authors also stated that quality is synonymous with *high quality* or *top quality*. Since this paper is dealing with quality in HEIs, it is important to provide its definition from this perspective. Very comprehensive and satisfactory definitions of

quality in HEIs compared to definitions of quality in businesses are provided by Koslowski (2006). This author compared definitions of quality in business provided by Garvin (1988) and definitions of quality in context of HEIs provided by Seymour (1993). Accordingly, definitions mentioned by Koslowski (2006) are presented in Table 1 prepared specifically for this paper.

Table 1. Quality Types and Definitions

Type of quality	Definitions of quality in businesses (Garvin, 1988)	Definitions of quality in HEIs (Seymour, 1993)
<i>Transcendent quality</i>	Transcendent quality is defined a result of the producer's expert training and professional standing.	The quality of education is defined a result of the expertise of Academic Staff.
<i>Manufacturing-based quality</i>	Product conforms to specifications and is fit to be used in a manner for which it was designed	HEI can achieve its objectives
<i>Product-based quality</i>	Quality is defined by presence or absence of a specific ingredient	Quality can be defined through assessing increase in students' learning as result of curriculum and faculty.
<i>Value-based quality</i>	Quality is defined as acceptable performance at an acceptable price.	Quality is defined based on rankings, marketing of HEI etc.
<i>User-based quality</i>	Quality is defined by the customer's needs, wants, desires, and preferences	Quality is defined through requirements from customers such are: labor market, government, students etc.

Source: (Koslowski III, 2006).

As this paper is dealing with quality as a part of ISO standards, it is inevitable to mention definition of quality stated by these standards. According to EN ISO 9000:2000 and EN ISO 9001:2008, quality is degree to which a set of inherent characteristics fulfils requirement (BAS EN ISO 9001, 2009).

In the end, it is possible to conclude that due to different types of quality, different types of people and different types of institutions, there are very different meanings of quality among researchers. However, it is possible to create one comprehensive definition of quality in higher education based on other definitions mentioned in previous paragraphs. Such a definition can be expressed as follows: Quality in HEI is increase in learning as one of important objectives of HEI based on satisfying costumers' requirements, realized as consequence of academic and administrative staff's expertise which results in high ranking levels of HEI, gaining reputation and becoming perceived as valuable institution.

The ISO 9000 definition says that quality management is set of coordinated activities to direct and control an organization with regard to quality (BAS EN ISO 9000, 2001). Hoyle (2007) in his book identified these activities as quality planning, quality control, quality improvement and quality assurance. According to Csizmadia (2006), the term quality management refers to the policies, systems and processes which are designed to ensure the maintenance and enhancement of quality within an institution. Quality management, in the higher education context covers quality control, quality assurance and quality improvement. Csizmadia (2006) stated that quality management has made issues about academic standards explicit. This means that academic standards are those expectations which have been established for students to meet, and institutional quality assurance procedures are the means by which institutions can demonstrate to those with an interest in higher education (e.g. students, employers of graduates and government) whether or not they are meeting those standards and expectations. According to Klarić (2005), quality management is managerial approach to quality in business which realize function of managing quality within the quality system in accordance with specific quality policy, quality

objectives and responsibilities, through quality planning, quality control and quality improvement. The most responsible positions for quality managing are top management representatives. However, all levels of management have their own responsibilities regarding quality management.

Lazibat, Sutic & Jurcevic (2009) mentioned definition of quality management system provided by Avelini Holjevac (2005). According to Holjevac (2005), quality management system (as citet in Lazibat et al., 2009, p. 5) refers to improvement system to increase flexibility, efficiency and effectiveness of operations; and any activity that seeks to ensure and create conditions that all the employees together achieve maximum efficiency and effectiveness of one goal: to produce the product and provide service when, where and how customers and consumers want and expect, for the first time and every time.

When speaking about Total Quality Management (TQM), Sabet, Saleki, Roumi and Dezfoulan (2012) said that it is a famous management method developed by Deming in US industry during and before the Second World War. Even though this method has its starting point in USA, it was further improved in Japanese industry. In addition, Sabet et al. (2012) discussed TQM in context of Higher Education and stated that nowadays many universities are using TQM. In this regard, TQM may be defined as a management policy, which becomes a tool for utilization and exploitation of all human, finance and technology resources in educational institutions. Sallis (2005) stated that as an approach, Total Quality Management (TQM) refers to a permanent shift in an institution's attention away from short-term expediency to the long-term quality improvement. Constant innovation, improvement and change are emphasized in this approach, and those institutions that practise it are kind of locked into a cycle of continuous improvement. In other words, they always seek to analyse what they are doing and plan to improve it. When speaking about TQM in context of higher education institutions, Bolton (1995) stated that impact of quality on the reputation is huge in higher education. He stated that since most HEIs are highly complex entities considering both, their objectives and structure, and that TQM provides set of techniques through which the difficult concept of quality can be approached.

In year 2005, European Network for Quality Assurance in Higher Education (ENQA) made first step in establishment of widely shared values, expectations, good practices related to quality and its assurance by institutions and agencies across the European Higher Education Area (EHEA). Standards and guidelines are prescribed in a manner that achievement of those is equal to implementing Bologna process. In other words, if these standards can be achieved, Bologna process can be achieved as well. Main aim of Standards and Guidelines for Quality Assurance in European Higher Education Area (ESG) is to support and encourage development of HEIs, which will foster educational achievements. ENQA developed standards and guidelines regarding internal and external quality assurance for the use of HE institutions and quality assurance agencies working in the EHEA, covering key areas relating to quality and standards (ESG, 2005). More about European Standards and Guidelines will be written under section on Bologna Process in B&H and Accreditation of HEIs in B&H.

Currently, ISO 9001:2008 is well known and recognized as an international standard on best practices in internal quality management. This standard provides series of general requirements that can be applied regardless of the organization's size, activity or ownership (Lazibat, Sutic, & Jurcevic, 2009). As ISO 9001:2008 is one of the essential elements in focus of this Paper, whole section will be devoted to it after literature review.

In fact, ISO 9000 refer to family of three standards: ISO 9000:2005 (fundamentals and vocabulary), ISO 9001:2008 (requirements) and ISO 9004:2000 (guidelines for performance improvement). It is of crucial importance for an organization that wants to be certified with ISO 9001:2008 to buy both standards (ISO 9000 and ISO 9001) and to go through both of them carefully. ISO 9000 has several principles that highly affects implementation of ISO 9001:2008 standard's requirements (ISO 9000 standards, n.d.). International Standardization Organization (ISO) published document in which eight principles are mentioned regarding ISO 9000:2005 and ISO 9004:2009. Those are as follows:

Principle 1 – Customer focus is of great importance for an organization mainly because it depends on the customers. Therefore, organization should understand current and future customer requirements and give efforts to exceed customer expectations.

Principle 2 – Leadership is important mainly because leaders are those who establish unity of purpose and direction of the organization. They should create and maintain the internal

environment in which people can become fully involved in achievement of an organizational objectives.

Principle 3 – Involvement of People is highly important because their full involvement enables their abilities to be used for the organizational benefit.

Principle 4 – Process Approach refers to managing activities and related resources as a processes.

Principle 5 – System approach to management contributes to the organization's effectiveness and efficiency in achieving its objectives.

Principle 6 – Continual improvement should be a permanent objective of an organization.

Principle 7 – Factual approach to decision making which means that effective decisions are based on analysis of data and information.

Principle 8 – Mutually beneficial supplier relationships since an organization and suppliers are interdependent and mutually beneficial relationships enhances the ability of both to create value (International Standardization Organization, 2012).

ISO 9001:2008 has five main sections. Those are as follows:

Section 1 – Quality Management System

Section 2 – Management Responsibility

Section 3 – Resource Management

Section 4 – Product Realization

Section 5 – Measurement Analysis and Improvement

(ISO 9000 standards, n.d.).

In the end, it is important to understand that while ISO 9000 is informing, ISO 9001 is the one who is implementing into practice. In other words, ISO 9000 contains definitions and terminologies that are being implemented through requirements defined in ISO 9001. Accordingly, these standards are complementary, and it is inevitable for an organization to understand all of them before being certified with ISO 9001:2008.

Very valuable comparison cited by Lazibat, Sutic & Jurcevic (2009) was conducted by Lazibat (2009) in his book entitled „Quality Management“. Author compared ESG, TQM, ISO 9001:2008 and EFQM model (fundamental concepts of excellence) with respect to several categories: quality policy and leadership, customers (stakeholders), workforce and learning, processes, resources, measuring results, improvement. This comparison is presented below in Table 2 (Lazibat T. , 2009).

Table 2. Comparison of QMS Models Applicable in HEIs

	ESG standards and guidelines (internal & external)	TQM principles*	ISO 9001:2008 requirements	EFQM – fundamental concepts of excellence
QUALITY POLICY & LEADERSHIP	- policy and procedures for quality assurance	-management support	- management responsibility - quality manual, policy and goals	- leadership and constancy of purpose
CUSTOMERS (STAKEHOLDERS)	- assessment of students - quality assurance of teaching staff	- customer focus (chain of customers, internal customers, suppliers and internal suppliers) - satisfying all stakeholders needs	- monitoring customers satisfaction - defining criteria for suppliers evaluation	- customer focus - partnership development - corporate social responsibility

WORKFORCE & LEARNING	<ul style="list-style-type: none"> - quality assurance of teaching staff 	<ul style="list-style-type: none"> - participation - team work - all employers included - empowering - continuous learning 	<ul style="list-style-type: none"> - all employers included - education plans 	<ul style="list-style-type: none"> - people development and involvement - continuous learning
PROCESSES	<ul style="list-style-type: none"> - use of internal quality assurance procedures - development of external quality assurance processes - processes fit for purpose - follow up procedures 	<ul style="list-style-type: none"> - processes focus 	<ul style="list-style-type: none"> - define all processes and their interrelationship - define procedures for: control of documents, control of records, internal audits, control of non-conforming products, corrective action, preventive action 	<ul style="list-style-type: none"> -management by processes and facts
RESOURCES	<ul style="list-style-type: none"> learning resources and student support 	<ul style="list-style-type: none"> - partnership relation with suppliers - providing good task instructions, tools they need and good working conditions for productive workforce 	<ul style="list-style-type: none"> - sufficient, professional, competent work-force - good working environment - appropriate infrastructure - partnership with suppliers 	<ul style="list-style-type: none"> - value adding partnerships with suppliers and employers
MEASURING RESULTS	<ul style="list-style-type: none"> - approval, monitoring and periodic review of programmes and awards - information system - public information - periodic reviews 	<ul style="list-style-type: none"> - quality methods and tools - benchmarking 	<ul style="list-style-type: none"> - measurement, analysis and improvement - internal audit requirement 	<ul style="list-style-type: none"> - result orientation

IMPROVEMENT	- reporting - system wide analyses	- continuous improvement (worker suggestions, quality methods)	- corrective and preventive actions requirement - procedure to manage non-conforming product/services - continuous improvement	- continuous learning, innovation and improvement
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Source : (Lazibat T. , 2009).

There are many empirical evidences in literature that proved benefits of different quality management systems in education. It is important to remind that ISO 9000 and often used to refer to a family of three standards: ISO 9000:2005 (fundamentals and vocabulary), ISO 9001:2008 (requirements) and ISO 9004:2000 (Guidelines for performance improvement). Before implementing QMS in an organization, it is important to go through both, ISO 9000 and ISO 9001 because first one explains the principles of the quality management system, while ISO 9001 explains requirements that an organization has to meet in order to get the certification (ISO 9000 standards, n.d.). Accordingly, when speaking about benefits of ISO 9000 for an organization, we speak about the benefits of ISO 9001 and vice versa.

Bolton (1995) concluded that, as QMS focused on individual values, proper way of satisfying demand, quality assessment, reducing costs as important goals within the HEIs, TQM represents great opportunity to improve every aspect of HEI in a systematical manner.

Cheng, Lyu and Lin (2004) presented experiences of introducing ISO 9000 into Taiwan's HE systems. After empirical investigation and case study, authors came to conclusion that ISO 9000 quality systems have positive impact on the education quality. Additionally, authors provided five-stage framework to clarify the role of an ISO 9001 QMS. Quality certification is therefore powerful tool to improve education. Their research is great example of empirical evidence about ISO potential in provision of benefits for HEIs.

Curkovic and Pagell (1999) starting with the fact that despite its widespread international acceptance, ISO 9000 is surrounded by controversy and criticism, authors observed potential of ISO 9000 to result in competitive advantage. Authors concluded that if well implemented, ISO 9000 can result in greater efficiencies, cost reductions, and improved productivity. Therefore, ISO 9000 is a trend in quality management which cannot be ignored.

Gardner (1997) stated that along with ISO 9000, the audit process is recognized as organizational in nature, it is integrated with other key validation methods to help evaluate and determine the effectiveness of the quality system across the organization. Therefore, it is suggested to adopt ISO 9000 because it increases organizational awareness, contributes to organizational TQM, improves expertise of program audit administrator and staff.

Al-Rawahi, Bashir (2011) compared organizational differences and some aspects related to the implementation of ISO 9001:2000. Authors collected data from forty two ISO 9001:2000 certified organizations, and they tested previously mentioned aspects. Results indicated that there is no strong evidence that the motives for implementation, the process and cost of achieving certification, the perceived benefits, and the shortcomings differ significantly according to organization size or sector type. This means that organization should not consider size or sector type when deciding about certification. Accordingly, ISO 9001:2000 standard is beneficial for all types of organizations regardless of their size; sector etc. .

Draguta (2011) discussed contemporary issue of education which is fact that regardless of diploma & university reputation, employment is not guaranteed to graduates. HEI system quality is nowadays issue of not only students, but also their parents. Author concludes that among several programs initiated to improve the quality of educational systems; the most important are international standard EN ISO 9001:2008 and TQM.

Gamboa & Melao (2012) were researching advantages and disadvantages regarding ISO 9001:2000 in educational institutions. Results identified four internal benefits (standardization and

efficiency; dynamics of continuous improvement; provision of strategic focus and foundation for planning; increased participation of people), two external benefits (improved market credibility; promotion of competitiveness), three disadvantages (increased bureaucracy; difficulties associated with its implementation process) and four success factors (quality team; management commitment and support; communication with and involvement of all members; previous level of organization).

Psomas, Pantouvakis, Kafetzopoulos (2013) conducted empirical study on 100 companies certified by ISO 9001:2008 standard, using linear regression to process data collected from quality managers from mentioned companies. Authors aimed to measure impact of ISO 9001 effectiveness on performance of company. Results indicated that ISO 9001 effectiveness has great contribution to performance of service companies. In fact, influence of ISO 9001 to company's service operational performance is direct and significant, while its impact to financial performance is indirect.

Establishment and Development of HEI Star University

Higher Education Institution Star is located in Bosnia and Herzegovina. With aim to provide highest possible opportunities for its students, institution from the very beginning showed its loyalty to following world standards, and it implemented ISO 9001:2008 and started with implementation of standards for accreditation required by HEA.

As one of the obligations regarding implementing standards for accreditation required by HEA, Star University has to prepare annually Self Evaluation Report. This is being done through organization of annual Self Evaluation in which all Academic and Administrative units submit their Self Evaluation Reports to Quality Manager who prepares one comprehensive Self Evaluation Report in the level of HEI.

Within this report, Star university had to prepare list of indicators of quality that will be followed carefully in the level of each department, faculty and finally in university level. Accordingly, this HEI identified following indicators of quality as important to follow:

1. Passing rates
2. Average grade
3. Evaluation of academic staff by students (evaluation of courses)
4. Students satisfaction survey
5. Number of publications

As Star University implemented standards for accreditation and ISO 9001:2008, it is very important to clearly understand both of them. Therefore, in Table 3, comparison and brief explanation of both of them is presented.

Table 3. ISO 9001:2008 & HEA Criteria in B&H

HEA Criteria in B&H	ISO 9001:2008
Criteria 1 - Development and strategy of HEI Criteria 1.1 - Creating strategy through consulting with all actors, formal adoption of strategy and making it publicly available. Criteria 1.2 - Through strategy , mission, vision, strategic goals and relevant plans and activities for each strategic goals must be developed.	0.1. General - QMS needs to be strategic decision of one organization. 5. Management Responsibility
Criteria 1.3. - Institution needs to have effective system and procedures for monitoring and evaluation of objectives' implementation.	4.1. Conduction of monitoring, measurement where possible and processes analysis 5.6. Revision by Management 5.6.1. Generally 5.6.2. Inputs for revision 8. Measurement, analysis and improvement 8.2. Monitoring and measurement

<p>Criteria 2 - Management, internal QA and quality culture</p> <p>Criteria 2.2. - HEI promotes quality culture, develops comprehensive and effective system for QA</p> <p>Criteria 2.3. - Policy and procedures for internal QA</p> <p>Criteria 2.4. - Institution has formal body for quality assurance</p>	<p>4. QMS</p> <p>4.1. Organization must set up, document, implement and maintain QMS and improve its effectiveness and efficiency</p> <p>4.2. Documentation requirements - organization must have quality policy, quality manual, procedures and records.</p> <p>5.3. Quality policy is responsibility of Top Management</p>
<p>Criteria 3. - Procedures for QA of study programs</p> <p>Criteria 3.1. - Procedures for proposing, adoption, monitoring and implementing study programs are set up and they are being implemented</p> <p>Criteria 3.2. - Analysis and regular monitoring of study programs</p>	<p>7 Product realization</p> <p>7.1. Planning product realization</p> <p>7.2. Processes related to customers</p> <p>7.2.1. Determining requirements regarding product</p> <p>7.2.2. Revision of requirements regarding product</p> <p>7.2.3. Communication with customer</p> <p>7.3.4. Revision of design and development</p>
<p>Criteria 4 - Procedures for assessment of students</p> <p>Criteria 4.1. - HEI has and implement procedures for students assessment (grading). Those procedures assure fair, transparent and consistent grading students, and they are enacted via formal act adopted by senate.</p> <p>Criteria 4.2. - HEI regularly collect data and analyze success of students (passing rates) in the level of study program and HEI, and conduct specific activities towards improvement of students' success.</p>	-
<p>Criteria 5 - Human Resources</p> <p>Criteria 5.1. - HEI assure enough of qualified Human Resources in order to achieve educational goals.</p> <p>Criteria 5.2. - HEI develops policy of specialisation of staff, and provide them professional development and scientific specialization.</p> <p>Criteria 5.3. - HEI once a year presents publications of its own staff realized in previous academic year.</p> <p>Criteria 5.6. - HEI employes enough of administrative and support staff in order to assure regular implementation of actions, and assure their education, specialization and evaluation.</p>	<p>6.2. Human Resources</p> <p>6.2.1. Human Resources must be competent. Competence is based on adequate education, training, skill, experience.</p> <p>6.2.2. - Competence, training and awareness</p> <p>Organization must: a) determine necessary competence; b) assure education, or other actions in order to achieve competence; c) evaluate effectiveness of undertaken actions; d) make sure that staff is aware of relevance and importance of their actions; e) conduct adequate records on education, training, skills, experience.</p>
<p>Criteria 6 – Quality of Physical Resources</p> <p>Criteria 6.1. – HEI assure enough of resource for complete staff and students. Adequacy of these resources is being evaluated regularly through internal evaluations.</p> <p>Criteria 6.2. – HEI plans investment of financial assets in a manner that part of annual revenue is being invested in improvement of physical</p>	<p>6 Resources Management</p> <p>6.1. Resources Assurance</p> <p>6.3. Infrastructure – involving buildings, working area, hardware, software, transport, communication, information system etc.</p> <p>6.4. Working environment</p>

resources. Criteria 6.3. – HEI has adequate IT equipment which improve quality of teaching. Criteria 6.4. – HEI owns adequate library equipped with enough number of units in both printed and electronic form, and adequate space for using of library services.	
Criteria 7 – Information system Criteria 7.1. – HEI collects, analyse and use information relevant for improvement of its activities. Criteria 7.2. – HEI has information systems that enable precise analysis of passing rates of students for each course, year and study program per examination periods, and ratio of teachers and students etc.	8.4. Data Analysis Organization must collect and analyse adequate information in order to improve the QMS. These information are results of measurements and monitoring. Data analysis can provide information about: a) customer satisfactions; b) accordance with product requirements; c) characteristics and trends of processes and products; d) suppliers.
Criteria 8 – Presenting public information Criteria 8.1. – HEI regularly publish objective and real information on all programs and titles it offers, at least through web page. Criteria 8.2. – HEI determines communication strategy Criteria 8.3. – HEI every year before registration of students assure printing of students guide for future students.	7.2.3. Communication with customer Organization must define and implement effective arrangements for communication with customer about the information on product , processing the questions (orders...) and feedback from customer including complaints.
Criteria 9 – International cooperation (relations)	-

Source: Table prepared for this study.

Results.

Considering its strategy, quality policy and priorities when it comes to organization of three main processes at Star University, teaching, research and services, this institution defined five indicators of quality, and carefully monitored it over years.

Passing rates of students

After each semester, Star University prepare reports on passing rates and average grade. Reports are being prepared in Faculty and University level, and they are being adopted by relevant committees and authorities. Based on Reports prepared over years, following table has been prepared (Table 3), and comparison was conducted in graph 1.

Table 4. Passing Rates of Students

Indicator of quality	2009	2010	2011	2012	2013	Scale
Passing rates	68,00 %	70,09 %	89,98 %	82,10 %	88,80 %	0-100 %

Source: reports of Star University.

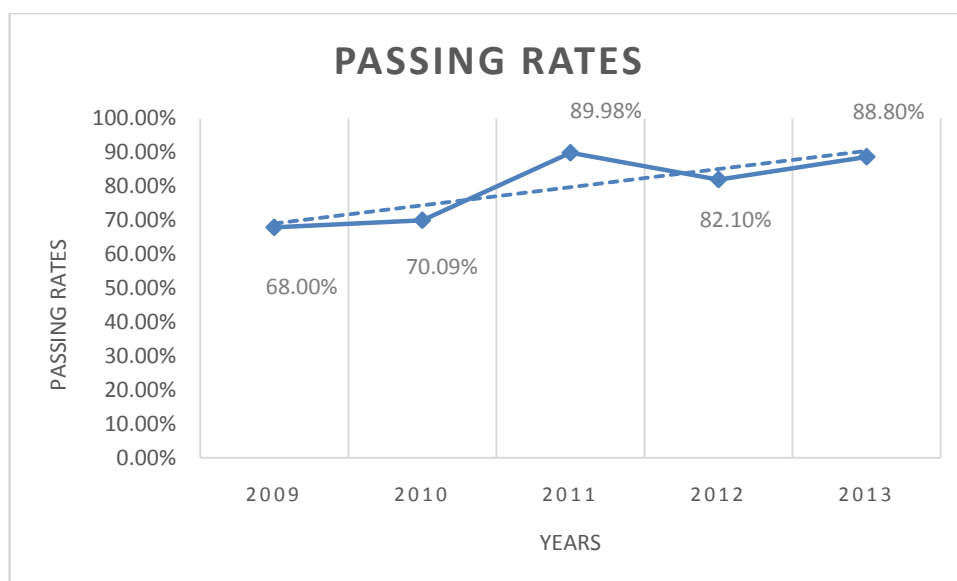


Figure 1. Passing Rates of Students (source: reports of Star University)

It is possible to conclude that Star University conducted great improvement in terms of students' passing rates. Trend line visible in Graph 1 says that there is sustainable growth in passing rates of students. From 2009 to 2013, passing rates increased for 14 %.

Average grade of students

Another very important indicator that must be followed by HEI in order to get accreditation by HEA is average grade of students. Fact that University prepared reports for all years of its existence says enough about how much seriously institution perceive this indicator of quality. Average grade in the level of University Star per years from 2009 to 2013 are presented in Table 5, and compared in Graph 2.

Table 5. Average Grade of Students

Indicator of quality	2009	2010	2011	2012	2013	Scale
Average grade	8,01	8,023	8,45	8,51	8,46	5-10

Source: Reports of Star University

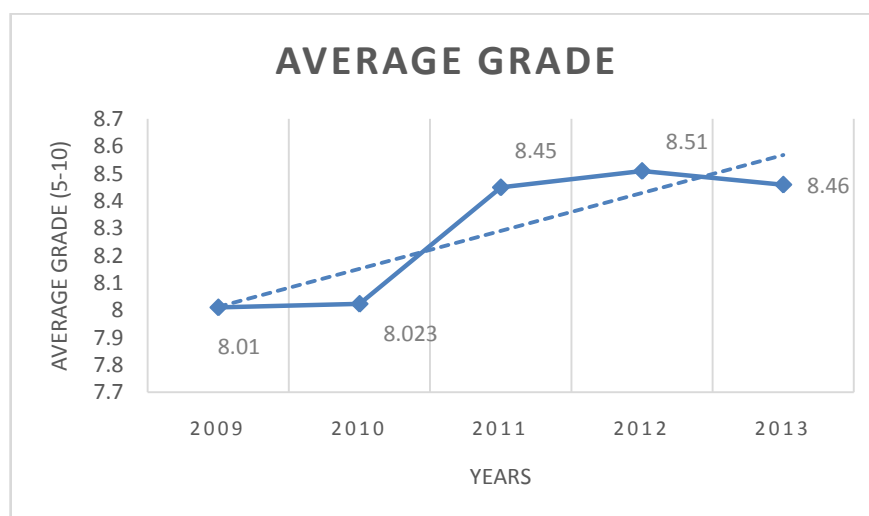


Figure 2. Average Grade (source: Reports of Star University)

Again, trend line visible in Graph 2 indicates that there is sustainable growth of average students' grade in University level. In fact, average grade was increased between 2009 and 2013 for

value of 0,45. Accordingly, one can conclude that by following reports on average grades and conducting corrective measures to eliminate identified problems, HEI Star improved quality in teaching and services which resulted in better results of students in the examinations.

Evaluation of Academic Staff by Students

In order to comply with accreditation criteria of HEA and Law on Higher Education, Star University must conduct after each semester evaluation of academic staff by students. In this way, students have an opportunity to evaluate performance of academic staff member during the year. This is being done through survey that is being activated online. Questions are examining variety of aspects regarding academic staff such are: competence to teach respective course, preparation for lectures, time accuracy, readiness to help his/her students to achieve learning objectives, dedication to serving students while searching for knowledge etc. Accordingly, University Star was carefully following this indicator of quality of academic staff over years and preparing reports. Based on those reports, Table 6 has been prepared. In addition, results are compared in Graph 3.

Table 6. Evaluation of Academic Staff by Students

Indicator of quality	2009	2010	2011	2012	2013	Scale
Evaluation of academic staff by students (evaluation of courses)	2,85	2,89	2,93	2,9	3,02	1-4

Source: Reports of Star University

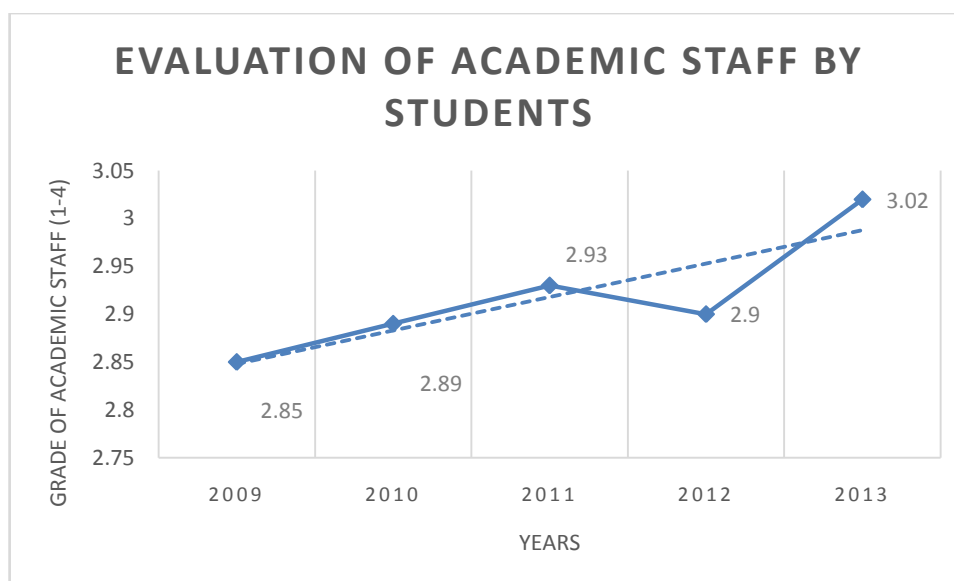


Figure 3. Evaluation of Academic Staff by students (source: Reports of Star University)

Graph 3 indicated great improvement in quality of academic staff in eyes of students at Star University. In fact, in the scale from 1 to 4, starting from 2009 and ending with 2013, students positively changed their opinion about academic staff for value of 0,17. Trend line visible in Graph 3 indicated sustainable growth in grade of academic staff.

Students' satisfaction with University

According to ISO 9001:2008, focus of organization on client (customer) is of great importance for development of organization. Star University is aware of students' satisfaction as most important indicator of quality of its services. Therefore, in annual basis, University conducts research on students' satisfaction which results with Annual Students Satisfaction Report. In this report, institution presents students' satisfaction with University's academic staff, administrative staff, campus, dormitory, study programs, personal development, education facilities, and cafeteria. In order to make this research more objective rather than subjective, University's

students are in charge of doing this research and preparing this report. Table 7 presents average grade of students' satisfaction (Likert's scale 1-7) from 2011 to 2013 year. Results from table are also compared in Graph 4.

Table 7. Students' Satisfaction

Indicator of quality	2009	2010	2011	2012	2013	Scale
Students satisfaction with University	-	-	4,41	4,94	5,63	1-7

Source: Reports of Star University

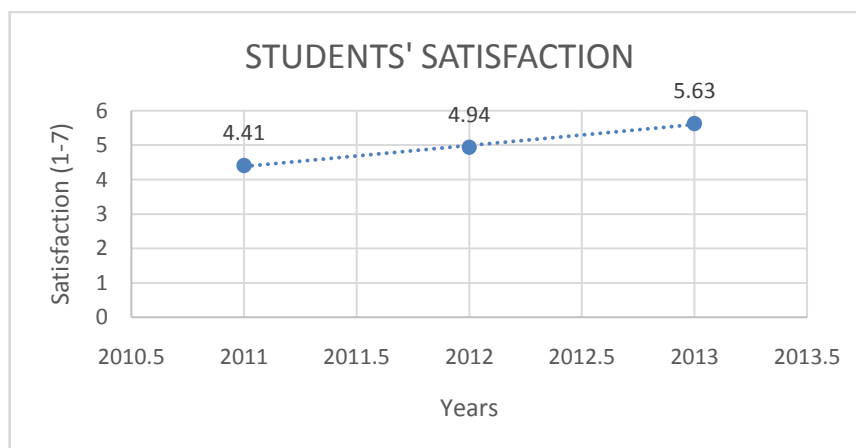


Figure 4. Students' Satisfaction – Average Grade (source: Reports of Star University)

When it comes to data presented in Graph 4, trend line leads to conclusion that students' satisfaction grows over years. From 2011 to 2013, average grade of students' satisfaction with Star University increased for value of 1.22 which is great improvement of this indicator of quality.

Number of publications

Research is one of three most important processes at Star University. Report on number of publications was completed in 2012 and 2013. Unfortunately, this indicator of quality was not followed carefully from the very beginning in the University level. However, data regarding mentioned two years provided important conclusions, and are presented in Table 8 and Graph 5.

Table 8. Number of Publications

Indicator of quality	2009	2010	2011	2012	2013
Number of publications	-	-	-	81	134

Source: Reports of Star University

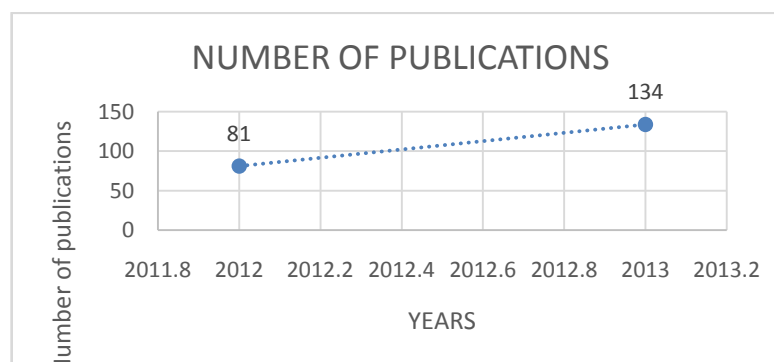


Figure 5. Number of Publications (source: Reports of Star University)

Data regarding number of publications as important indicator of quality based on reports regarding 2012 and 2013 (HEI started to do this report from 2012) provided valuable information about improvement. In fact, number of publications in 2013 was higher for 53 compared to previous year. This indicator of quality is regulated at HEI in a manner that every member of academic staff has obligation to publish number of papers (number defined by management) during the academic year. Every dean is responsible to monitor this indicator in level of his faculty by calculating number of publications for each member of academic staff individually, and comparing them over years in order to see if there is improvement of quality of research conducted by academic staff. Number of publications in institution level is very important indicator which shows that employees of HEI are much more dedicated to research in 2013 compared to 2012.

Conclusion.

Aim of this work was to use case of Star University located in Bosnia and Herzegovina to provide empirical evidence that implementing ISO 9001:2008 and standards for accreditation required by Agency for Development of Higher Education and Quality Assurance (HEA) are good way to improve quality of HEIs in Bosnia and Herzegovina. Having in mind that Star University was conducting reports and following indicators of quality (passing rates, average grade, evaluation of academic staff by students, students' satisfaction, number of publications) as a response to requests of accreditation criteria and ISO 9001:2008 quality management system, it is possible to say that ISO 9001:2008 along with HEA's requests for accreditation are good way to improve quality of Higher Education Institution in Bosnia and Herzegovina. Therefore, this paper provides empirical evidence that ISO 9001:2008 and standards for accreditation required by Agency for Development of Higher Education and Quality Assurance (HEA) are very useful and beneficial for all private universities in Bosnia and Herzegovina on their way to improve quality. Since there is no enough research about this issue in Bosnia and Herzegovina, this work can be good stimuli for new researches that will go more deeply into issue.

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Published in the Russian Federation
European Researcher
Has been issued since 2010.
ISSN 2219-8229
E-ISSN 2224-0136
Vol. 75, No. 5-2, pp. 962-969, 2014

DOI: 10.13187/issn.2219-8229
www.erjournal.ru



UDC 33

A Keyword Analysis for Human Resource Management Factors

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Abstract. With the constant increasing in technology and education, with development of multinational corporations and frequent changes in economic status and structures, Human Resources become the most crucial, the most reliable and necessary department. Moreover, in many companies, Human Resource Department is the most important department. The main purpose of this research is to mark off top rated factors related with Human Resource Management by analyzing all the abstracts of the published papers of a Human Resource Management journal for the period between the first issue of 2005 and the first issue of 2013. We identified the most frequent categories of the articles during this analyzed period. The literature is reviewed according to the identified factors related to Human Resource Management. If the keywords about Human Resources (35,7 %) is not considered, it is observed that the researches, for the selected period, have organizational approach (39,2 %) (Management, organizational strategy, organizational performance, organizational culture, contextual issues, technical issues and location) and from the individual approach (24,4 %) (Individual performance, training and education, employee rights, and behavioral issues). Furthermore, it is also observed that the researchers (a) mainly give importance to the practice more than the theory and (b) consider the organization more than the individual.

Keywords: human resource management; journal; abstracts; keywords analysis.

Introduction.

It has been extensively considered that human resources are one of the key elements of an organization. The management of human resources depends on very complex and interrelated factors. Despite the related factors have been identified, theorized and the relationships among the factors have been searched a lot, with changing economic, social and psychological behaviors, the understandings and therefore research interests may change thorough the timeline.

This research wants to detect the current research interest on Human Resources Management (HRM) related factors. Therefore, we considered one relevant specific journal which is highly indexed in the area between 2005 and 2013, descriptively analyzed the keywords of all the papers in this interval, and identified the most frequent factors. Moreover, a literature review about the identified factors from the subject journal has been provided and the paper is accordingly

concluded. We are hoping that this research will be beneficial especially for researchers in this field and moreover for managers in human resources departments.

Identified Factors in Human Resource Management.

For this research we choose one of the popular and powerful journals from the field of human resources management. "Human Resource Management Review" journal has four issues per year. We collected the journal's abstracts from the beginning of 2005 to the first issue of 2013 and keywords of the published papers are collected. The keywords are summarized and grouped under the categories by considering their similarities. Categories are named according to human resources terminology. Finally, the frequencies of all categories are calculated, and presented in the table (Table 1).

Table 1. Frequency Distribution of Keyword Categories

Keyword Names	Frequency	Percentage
HR Related keywords	203	35,70 %
Management Related Keywords	73	12,90 %
Individual Performance	49	8,70 %
Training and Education	48	8,50 %
Organizational Strategies	46	8,10 %
Employee Rights Related Issues	32	5,60 %
Organizational Performance	27	4,80 %
Organizational Culture related keywords	22	3,90 %
Contextual Issues (Specific Industries, Organizations, etc.)	29	5,20 %
Theories	16	2,80 %
Technical Issues (Technology, Information Systems, software programs, tools, etc.)	14	2,50 %
Location	10	1,80 %
Behavioral Issues	9	1,60 %
Total	568	100 %

In the following section, the factors which have the highest frequencies are reviewed by considering the articles from the selected journal.

Literature Review.

Human Resource Management.

While categorizing the keywords of this group, the overall management of human resources is considered. Internal and external Organizational environment are continuously changing and evolving every day. As a result of Globalization and technological development as well as the changing nature of work, company structures are changing too. In order to respond these factors, there appear new and growing number of trends such as offshoring and virtual organizations towards changed alternative forms of organizations (Colakoglu, Lepak, & Hong, 2006). Therefore, the understanding of human resources management has been reshaped too.

Burke and Ng (2006) reported that several factors have come together over the past decade to impact the role, relevance and practice of human resource management in organizations. They continued that these factors operate at many different levels and raise important issues and challenges for the management of organizations. They claimed that in the past decade, the understanding of the relationship of HRM practices and firm performance has been searched a lot and accordingly HRM becomes a major competitive advantage that cannot be copied readily by one's competition. Therefore, they suggest that HR professionals should have new roles, though many HR professionals may not yet be well or fully equipped for their new challenges.

While Breugh (2008) was searching about employee recruitment, he noticed that research on employee recruitment topics has increased dramatically over the last forty years. Breugh (2008) identified that recruitment related issues have focused on some important issues such as recruitment methods and realistic job previews. He also found that the research topics such as targeted recruitment and the site visit have received relatively little attention, but he suggests that

they have the potential to be quite important. Breugh (2008) suggested a model of the recruitment process from.

Van Buren, Greenwood and Sheehan (2011) investigated Strategic human resource management and the decline of employee focus. The purpose of Van Buren, Greenwood and Sheehan's (2011) research is to critique the shift from employee focus to strategy focus in the role of HRM. Authors conceptualized unitarism at three levels (normative, conceptual, and empirical) and explained the disparity between strategic HRM's rhetorical promotion of unity of organizational and employee goals, and actual HRM practice of privileging strategic interests over employee interests. Their study was based on analyzed responses to a national survey of the membership of the professional body of the Australian Human Resources Institute (AHRI). They furthermore illustrated how HRM professionals prioritize strategic and employee foci and tried to find support for the argument that HRM professionals have made the shift to a strategic mindset. They found that despite employee relations are accepted as a primary responsibility for HR, it is not accepted as important to the ongoing role of HR. In contrast, they found that the role of HR is highly focused on its strategic import. Finally they concluded that whilst ethics activities are identified in policy development, they are lagging in programs and systems.

Mayson and Barrett (2006) research 'science' and 'practice' of human resource management in small firms. They noticed that there is growing evidence for informal characterization of human resource management practice in small firms; there is less evidence about the science, or explaining the reason for the case. Mayson and Barrett (2006) reported that a number of writers argue that a strategic approach to managing employees is vital for the success of all firms including small ones. They claimed that how HRM or more specifically strategic approaches to HRM contribution to small and entrepreneurial firm growth and survival cannot be fully understood.

Mayson and Barrett (2006) based their work on the previous literature and they conclude that small and medium enterprises make an important contribution to the performance of developed and developing economies through the world. They also conclude that, the effective use of resources, including human resources, to create and exploit new opportunities for business growth which is the key to firm sustainability and economic development is essential.

Lengnick-Hall, Lengnick-Hall, Andrade and Drake (2009) reviewed the evolutionary and chronological perspective about the development of strategic human resource management (SHRM) literature. They divide the reviewed literature into seven themes that reflect the directions and trends researchers have taken over approximately thirty years of research. The identified themes include (1) contingency perspectives and fit, (2) shifting from the understanding of managing people to creating strategic contributions, (3) expanding HR system components and structure, (4) increasing the scope of SHRM, (5) realizing HR implementation and execution, (6) assessing SHRM outcomes, and (7) methodological issues. They suggested each of these themes as a significant role in the evolution of the field.

Lengnick-Hall, Lengnick-Hall, Andrade and Drake (2009) reported that unlike some topics (e.g., total quality management, business process reengineering) which have weak status in human resource management over the years, strategic human resource management has achieved a stable power.

Individual Performance.

Under this section, the keywords related to the performance of employees are included. Garza and Morgeson (2012), by focusing on organizational values, have neglected the potentially important role that individual values can play in pursuing HR certification. They assumed that personal values of employees towards their development more broadly and HR certification more specifically have a critical influence on the performance of them.

The study of Harms (2011) explains the theory of attachment styles. He reviewed the existing research which links attachment styles to leadership, trust, satisfaction, performance and other outcomes. Moreover, Harms (2011) presented significant relationships between attachment styles and major organizational outcomes in order to underline the importance of attachment orientation in the modern, relational workplace. Therefore, as Attachment theory suggests the relationship between the employee attachment to the company and the employee performance, other issues such as organizational commitment, satisfaction, employee (individual) motivation, etc. should also be considered.

One of the ways in order to increase employee performance is sharing the existing knowledge among employees. Wang and Noe (2010) reviewed qualitative and quantitative studies of individual-level knowledge sharing. Based on the literature review they also, developed a framework for understanding knowledge sharing research. The framework identifies five areas of emphasis of knowledge sharing research: organizational context, interpersonal and team characteristics, cultural characteristics, individual characteristics, and motivational factors (Wang & Noe, 2010).

Training and Education.

Employee training and education are fundamental issues in human resources management. The employees should be continuously trained for targeted performance. According to Babcock (2004), because of the potential benefits as a result of knowledge sharing, many organizations have invested considerable time and money into knowledge management (KM) initiatives and knowledge management systems (KMS) which use specific technologies to enhance the collection, storage, and distribution of knowledge. Wang and Noe (2010) noted that at least \$31.5 billion investments are lost per year by Fortune 500 companies as a result of failing to share knowledge. Therefore, we can conclude that in order to prevent the failures as a result of knowledge sharing or other issues, the overall organization should take specific training and education.

McIver, Lengnick-Hall, Lengnick-Hall, and Ramachandran (2012) assumed that organizational strategy can be constructed by its ability to generate, combine, recombine, and exploit knowledge. Therefore, in order to understand knowledge in organizations, McIver, Lengnick-Hall, Lengnick-Hall, & Ramachandran (2012) developed a new framework by integrating a commodity view and a community perspective and by focusing on knowledge-in-practice. They also tried to clarify the organizational knowledge by examining the underlying knowledge-based characteristics of work practices.

According to Storey (2004), past research shows that training is an important HRM issue for many small firms. However, he claims that formal training is less likely to be provided in these firms. Therefore, we may suggest searching and hiring qualified staff at the very beginning for those small firms.

Performance Measurement and Assessment.

One of the fundamental duties of Human Resources Management is measuring and assessing the performance of the employees. Therefore, some organizational and employee related procedures such as arranging necessary training and education, renewing contracts, etc. may be started. Some of the researchers evaluated the performance measurement at very beginning of hiring procedure. Huffcutt, Van Iddekinge and Roth (2011) developed a theoretical model of interviewee performance in selection interviews. According to their model, the construct of interviewee performance is determined as a central mediating variable between candidate attributes and interviewer ratings. Their model promotes a fundamental shift about employment interviews, from the focus on interviewer ratings to a focus on interviewee performance. Furthermore, their model includes six sets of factors that may influence interviewee performance, interviewer ratings, or both. They suggest that their model about interviewee performance leads to a greater understanding of interview dynamics and potentially positive benefits for both candidates and organizations.

Some researchers suggest using technology in order to enhance the measurement and assessment of employee/organizational performance. Stone, Lukaszewski, Stone-Romero, and Johnson (2013) reported that the use of electronic selection (e-selection) systems in organizations is continuously increasing. In their research, they reviewed the influencing factors of their effectiveness and acceptance by job applicants (applicant acceptance). Moreover, they examine the effectiveness and acceptance of these systems at all stages of the selection process which includes (a) job analysis, (b) job application, (c) pre-employment testing, (d) interviewing, (e) selection decision-making, and (f) evaluation and validation. They also suggested some implications for e-selection system design and implementation. They believe that their review helps organizations to design and implement e-selection systems that consider both the needs of both organizations and individuals.

Organizational Strategies.

According to Way and Johnson (2005), organizational strategies define the process or set of processes which are used to achieve organizational goals and objectives. They noted that

Organizational strategies are influenced by the feedback of the organization's various functions related to its ability to provide the resources and inputs as well as to produce the essential outcomes in order to contribute to the attainment of overall organizational goals and objectives. Therefore, the feedbacks coming from Human Resources and available tools in terms of Human resources are some of the primary sources influencing the determination and establishment of the strategies of the organization in achieving its goals.

Way and Johnson (2005) investigated about the impact of strategic human resource management (SHRM). They also proposed a framework, based on their review, as an integration and extension of the theoretical foundations of SHRM which is suggested as a useful guide to accurately conceptualize and measure organizational effectiveness, which has been an elusive outcome in prior SHRM research.

Technology and Information systems can enhance making fruitful strategic decisions regarding the organization and its assets. The decisions related to the implementation of these systems can also depend on the employees. However, the role of Human Resources in the implementation of such systems seems weak. Schalk, Timmerman and Heuvel (2012) studied the influence of strategic considerations on decision making regarding e-HRM applications. According to their review, some past studies suggest that the added value of human resource management is the strongest when HRM decisions are linked to the organizational strategy. They found that practical knowledge about the influence of strategic considerations on decision-making processes regarding e-HRM is limited. Schalk Timmerman and Heuvel (2012) used case descriptions of three decision-making processes related to strategic considerations about decision-making process in large organizations.

According to Schalk, Timmerman and Heuvel (2012), the literature suggests that the added value of human resource management is strongest when HRM decisions are related to strategy. They reported that none of the three cases turned up a clear link with specific strategic deliverables and business drivers. Based on their results of the situation in the case studies, they concluded that with respect to e-HRM, Human Resources played no real strategic role. The fundamental goal of e-HRM is building an efficient infrastructure for the administrative role of Human Resources. They suggested that a strategic use of e-HRM is not the main goal of e-HRM implementation. The implementation of the systems may not be so much depended on the human resources. However, since human power adopts the implemented systems, we may suggest the effective role of human resources while taking the strategic decision of implementation of such systems. They may be useful in implementing useful and easy to use systems.

Employee Rights Related Issues.

The world is completely different compared to the past. People, community, rules, conditions and their expectations are completely different. Companies and their workforce consider many issues before and after employment. According to Burke and Ng (2006), organizations are employing the most educated workforce in the history of the world. They claimed that today's employees expect high salary, have the availability to take part in organizational decision-making, and expect to be treated fairly and to be respected. They also added that employees are concerned more about the effects of work demands and work hours on their family and on their personal lives. Therefore, it automatically affects human resources department and its activities in the organizations.

Chattopadhyay (2003) reported that employees' personalities can influence their attitudes and behavior in an organizational context. According to Mamman, Kamoche and Bakuwa (2012), since Perceived Low Status Minorities (PLSMs) differ in their personality and individual values, it is reasonable to expect that their reaction to injustice is various. PLSMs may be formed with respect to their perception of social identity such as gender, age, ethnicity and nationality. They provided the specific dimensions of personality and situations that can moderate PLSMs' reaction to violation of organizational justice.

Furthermore, according to them, experts generally agree that workforce diversity can produce positive outcomes such as novel and diverse ideas. They explored diversity, organizational commitment and organizational citizenship behavior by providing a review of literature on the subject and offered a framework in order to identify why some categories of employees are not motivated to contribute to the organization beyond the call of duty (in-role behavior). According to their results, it is indicated that workforce diversity can lead to undesirable outcomes.

Organizational Culture.

One other important factor in Human Resources Management is the organizational culture. The literature suggests a two way relationship between the culture and HRM. In their study about human resources reputation and effectiveness, Ferris, Perrewé, Ranft, Zinko, Stoner, Brouer and Laird (2007) found that recent literature has an interest on the entities' reputations in the organizational sciences and the consequences of such reputations for the various constituencies of these entities. According to them, while most of the research has focused on individuals and organizations, reputational phenomena can be studied equally effectively at the department or sub-unit level of analysis. They concluded that HR department reputation that has been neglected is critically important and has great potential to contribute to understand the roles, status, and positioning of HR departments in today's and future organizations.

The literature suggests a harmony between the organizational culture and the individual culture. Stone, Stone-Romero and Lukaszewski (2007) reported a rapid increase in cultural diversity among U.S. organizations. They claimed that the literature has little interest on the impact of diversity on the acceptance of human resource management processes and practices (e.g., recruitment, selection, training, performance appraisal, and compensation and benefits) by individuals and the effectiveness of such processes and practices. Therefore, they offered a model about the influence of culture on HRM processes and practices and examined the effect of cultural values on various HRM processes and practices. Moreover, Stone et al. (2007) considered the moderating effects of both individual culture and organizational culture on the relations between human resource management processes and practices and the acceptance and effectiveness of such processes and practices. They concluded that there may be negative consequences for individuals whose culture is different from that of the dominant culture.

Organizational Performance.

Organizations, have intention to increase their performance, should enhance the effectiveness of their human resources via Human Resources Management. The performance of the organization is very much depended on its willingness to achieve competitiveness in the marketplace. Some firms may not choose to be stable instead of being competitive. Therefore, they can shape their work power according to the determined strategies. Garza and Morgeson (2012) explored the link between organizational values and human resource certification. By considering the literature about the influence of organizational values on the behavior and attitudes of the organization and its employees, Garza and Morgeson (2012) suggested the influence of key organizational values on the acceptance of HR certification by the organization and its members. They aimed to explore the relationships between the organizational values of innovation, people orientation, and stability and the organizational use of HR certification for selection purposes. According to their results, it is clearly found that organizations have different values and these values may influence the selection decisions for the organizations which value HR certification. They suggested selecting candidates that already possess a given set of knowledge and skills for the organization that values innovation and wishes to save time and money associated with developing employees. Furthermore they identified that the innovative organizations considers HR certification when making selection decisions, but, the organizations that want to be stable and predictable in their human resources may give less value for HR certification in their initial selection decisions. They assumed that the organizations want to be stable may choose to develop and train employees after hiring them in order to satisfy the needs of the organization. Garza and Morgeson (2012) suggested investigating other values such as learning and development for the organizational processes.

Some researchers suggest selecting innovative and inventive employees for specific firms to enhance their performance. Burke and Ng (2006) assumed that there will be a greater need for creativity and innovation from employees in the new service and knowledge-based industries-sectors which have grown much over the past decade. They suggested that the employees should continuously learn and update their knowledge and skills in order to be more competitive, since the industries have become more knowledge-based. They also strongly suggested that there is a greater need for the employees working more collaboratively on a variety of team-based structures. They finally recommended that organizations need a greater commitment and engagement of staff in order to enhance and keep their competitiveness.

Conclusion.

The constant and rapid increase in technology and education and the development of multinational corporations and frequent changes in economic status and structures made Human Resources the most efficient, the most reliable and the oldest management department through the organizations. The idea and the works of Human resources management have evolved and changed much through the history. The literature includes vast amount of theory and research on this field. Therefore, this study has been motivated to identify the most current trends in HRM research by focusing on one of the leading journals in the field of human resources management "Human Resources Management Review". We reviewed the selected journal's keywords for the period between the first issue of 2005 and the first issue of 2013. In Frequency Distribution of Keywords, it is identified that the articles are focused more on (1) human resources and its management (35,70 %), (2) management (12,90 %), (3) employees' individual performance (8,70 %) and their training/education (8,50 %), etc. If we don't consider the keywords about Human Resources (35,7 %), the remaining keywords mainly approach to the issue from the organization's perspective (39,2 %) (Management, organizational strategy, organizational performance, organizational culture, contextual issues, technical issues and location) and from the individual perspective (24,4 %) (Individual performance, training and education, employee rights, and behavioral issues). The remaining (2,8 %) considers the related theories about human resources. Therefore, it can be assumed that the researchers (a) mainly give importance to the practice more than the theory and (b) consider the organization more than the individual.

One of the limitations of this study is that it only provides a specific time interval and only one journal. We suggest for future studies to provide longer time period and also to include more journals. We assume that the researchers do not provide proper keywords for their studies and most of them only assign very general terms. We suggest that authors should consider more the keywords while writing their research papers.

According to the results, we finally suggest that the organizations should consider the benefits of both organizations and individuals before and after hiring their employees.

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Published in the Russian Federation
European Researcher
Has been issued since 2010.
ISSN 2219-8229
E-ISSN 2224-0136
Vol. 75, No. 5-2, pp. 970-979, 2014

DOI: 10.13187/issn.2219-8229
www.erjournal.ru



UDC 33

The Role of Human Resource Management in Employee Motivation

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Abstract. The main objectives of this study are to present the condition of Human resources management in Bosnian and Herzegovinian companies. Therefore, the developed survey questionnaire is conducted through the employees of Bosnian companies. Data was obtained from surveyed 193 employees, and descriptively analyzed using SPSS software. The results identified low level of human resources management in Bosnia and Herzegovina. It can be suggested that Bosnian companies should develop their human resources strategies and functions and enhance the motivation of their employees in order to get more benefit.

Keywords: human resources management; employee motivation; satisfaction; involvement; commitment; individual benefits; organizational benefits.

Introduction.

The need for improving Human resources management and strategies has been suggested by the literature. Generally, researchers agree that human resources are the main source for every company. The main objectives of this study are to present condition of Human resources management in Bosnian and Herzegovinian companies, moreover to show stage of development and implementation in human resources management. Bosnia and Herzegovina is small country with less developed economy and not stable political situation, with high percentage of unemployed people, also with high percentage of high-educated unemployed people. It can be asserted that supply for workforces is greater than demand in Bosnia and Herzegovina. Therefore, there appeared a need for research to identify the current situation in Human resources management in Bosnia and Herzegovina marketplace. This study starts with this introduction and continues with related literature review. The data and methodology is presented in the third section, research is based on survey data, distributed to the employees only in Bosnian and Herzegovinian companies and collected data is descriptively analyzed by SPSS software. Furthermore, the results of the questionnaire are presented in the fourth section. In the fifth section, the results are discussed. Finally, paper ends with the conclusion in the sixth section.

Literature Review.

Human Resource Management (HRM) has increasingly considered as a source of competitive advantage (Porter, 1990) because employees, and especially their knowledge, enhance organizational capabilities (Larsen, 2001, Castrogiovanni, Garrigos-Simon, & Peris-Ortiz, 2011).

Karatepe, Arasli and Khan (2007) investigated the effect of self-efficacy on job performance, job satisfaction, and effective organizational commitment on the employees of three, four, and five star hotels in Northern Cyprus. They tested the research hypotheses by using LISREL 8.30 through path analysis and identified that self-efficacy significantly influences job performance. They moreover found that job satisfaction has a significant positive influence on effective organizational commitment. Their test results also showed that job satisfaction and effective organizational commitment are negatively associated with intention to leave. The authors hope that their research can be beneficial for future studies that may wish to use this grouping to understand its potential impact on self-efficacy.

Niu (2010) reported that foodservice industry workers face much higher psychological pressure with relatively lower payment compared to other industry workers such as technology industry. In an ideal foodservice industry, he suggests the consideration of the human factor. He researched the relationship between self-efficacy and career commitment in the foodservice sector on 1025 foodservice employees and the results supported the relationship between self-efficacy and career commitment. He also found that high self-efficacy degrees indicate a higher level of career commitment. According to him, previous researchers have discussed numerous motivation factors affecting career commitment, but they have not examined the relative contributions of self-system, feelings and actions. Among the beliefs with which an individual evaluates the control s/he has over his/her actions and environment, self-efficacy beliefs are the most influential negotiator of human activity.

Walumbwa and Hartnell (2011) investigated the mediation role of employee perceptions of relational identification with the supervisor and self-efficacy on the relationship between transformational leadership and supervisor-rated performance. They used the individual's ability to be creative, innovative, inspiring, and take on challenging tasks to achieve organizational goals as the performance variables. They examined 426 employees and their 75 immediate supervisors from a large automobile dealer and identified that transformational leadership was positively related to self-efficacy and rated performance. They also found that relational identification with the supervisor mediated the relationship between transformational leadership and self-efficacy which therefore positively influenced employee performance. They suggested that future studies should consider objective work performance measures.

Sheehan (2005) investigated strategic human resource management (HRM) integration through organizations by proposing a strategic HRM integration model and testing the model via interviews with senior HR, finance and line managers in 13 Australian Best Practice companies. As a result of reviewing the change literature, he proposed some symbolic and ritualistic gestures to explain the engagement of strategic HRM integration. He suggested an ideological shift both from the HR profession and from stakeholders within the organization.

Snape and Redman (2010) explore the relationship between HRM practices and individual employee attitudes and behavior at the workplace by aiming to identify the relationships between social exchange and job influence/employee discretion. As a result of collected data from human resource departments in Northeast England, they found that there is a positive impact of HRM practices on organizational citizenship behavior, through an effect on perceived job influence/discretion. However, the results do not suggest an effect for perceived organizational support. According to their findings, there is a job influence and opportunity explanation of HRM effects on employee attitudes and behavior.

Nabi (2001) reported that previous research on career success has examined the differential importance of predictors of objective career success between genders. He aimed to identify the role of gender on subjective career success (SCS). He used two measures of SCS, intrinsic job success (IJS) and perceived career success (PCS), and a range of organizational policy perceptions and social support strategies as predictors by conducting a questionnaire collected from 439 administrative full-time employees in the UK. The results suggested slight support for the differential predictive power of the considered predictors of SCS for men and women. He also

identified that peer support was a more powerful predictor of men's SCS, whereas personal support was a more powerful predictor for women's SCS.

Chiang, Han and Chuang (2011) researched the relationship between high-commitment human resource management and individual knowledge-sharing behavior on 198 collected data from a survey of practitioners registered in the executive MBA programs of a university in northern Taiwan. They found that High-commitment human resource management was positively related to perceived organizational support and perceived organizational support was positively associated with organizational trust and organizational commitment. They also observed that Organizational commitment was positively related with knowledge-sharing behavior and furthermore Perceived organizational support and organizational commitment mediated the relationship between high-commitment human resource management and knowledge-sharing behavior. They suggested that, enterprises can foster knowledge-sharing behavior by adopting high-commitment HRM. They also suggested that employees become committed to their organization and then share knowledge when they feel the support of the organization.

Boselie and Wiele (2002) reported that there is a rising interest in theory and practice between human resource management and total quality management (TQM) and explored the consequence of human resource management and total quality management at the organizational level. They found that affirmative perception of single employees on the human resource management and total quality management concepts influences their satisfaction and reduces the probability of leaving the company. They also observed that "Co-operation within units", "leadership" and "salary" significantly affect employee satisfaction.

Marescaux, De Winne and Sels (2012) studied the soft human resource management and self-determination theory by testing whether basic need satisfactions mediates the relationship between five human resource practices and human resource management outcomes on 5,748 employees in Belgium. Their results showed that autonomy and relatedness satisfaction moderately mediate the relationship between HR practices and HRM outcomes.

Karatepe and Tekinkus (2006) explore the effects of work-family clash, emotional langour and intrinsic motivation, work performances, work satisfaction and affective organizational commitment on 363 front line employees of Turkish banks. They found that work-family conflict positively influences emotional langour and negatively influences job satisfaction. They also observed that intrinsic motivation has a significant negative impact on emotional exhaustion positive effect on work performance, work satisfaction, and affective commitment to the organization. They concluded that work performance positively increases job satisfaction; moreover work-family conflict and emotional exhaustion do not significantly affect job performance and organizational commitment.

Lingard and Lin (2004) investigated the relationship between career, family and job environment on women's organizational orientation on 109 Australian women in construction companies. They identified that career choice orientation, satisfaction with career progression, work involvement, supervisory support and perception of the organizational diversity climate have significant correlations with organizational commitment.

Szamosi (2006) investigate the expectations of future employees of small and medium enterprises in terms of organizational satisfaction and value on 55 university students who are willing to work for small and medium enterprises as a step for their career goal. According to the results, new generations are found to be expecting equivalent values and satisfactions outcomes from small and medium enterprises.

Latting, Beck, Slack, Tetrick, Jones, Etchegaray and Silva (2004) explored top management support for innovation and learning based on data collected from 252 employees and supervisors at six nonprofit human services agencies. They identified that workers may reciprocate support for innovation and learning as well as supervisory support for empowerment and service by increasing trust in management and improved service quality and client relationships.

Dewett (2007) study the relationship between intrinsic motivation, risk taking and creativity on the collected data from private R&D organizations in the South-west United States. They identified that intrinsic motivation interfere the relationship between specified antecedents and risk taking behavior and that this mediates the effect of intrinsic motivation on employee creativity.

According to Mamman, Kamoche and Bakuwa (2011), specialists agree that the variation in workforce can bring positive outcomes such as novel and diverse ideas. They searched variety,

organizational commitment and organizational citizenship behavior by proposing a framework to explain some employees are less enthusiastic to contribute to the organization beyond their duty. They identified that workforce diversity influences undesirable outcomes.

Kazlauskaite, Bucuniene and Turauskas (2012) investigated empowerment and its meaning in the HRM-performance relationship on 211 customer-contact employees in Lithuania hotels. They observed that organizational empowerment is positively related to psychological empowerment and organizational empowerment significantly influence job satisfaction and affective commitment. Furthermore, they showed that psychological empowerment and affective commitment influence organizational empowerment on customer-oriented behavior.

Shen (2010) explore the levels of employees' satisfaction with human resources management practices and differences in satisfaction between employee groups on 305 employees in four private Chinese companies. He found that satisfaction levels of employees vary and are influenced by personal characteristics such as a gender, age, position, education, working years and registration status.

Kuvaas and Dysvik (2009) investigated alternative relationship between different facets of work performance and perceived investment in employee development and intrinsic motivation on the data collected from 826 employees in Norway. They identified that the relationship between perceived investment in employee development and work effort is mediated by intrinsic motivation.

Data and Methodology.

Survey was delivered only to private and public companies, which exist in Bosnia and Herzegovina. Survey was collected from employees in different positions as well as from the employees in different levels of education.

Questionnaires were distributed online and personally, online form was developed and sent via e-mail to the human resource managers in the company or other responsible persons. A total of 193 employees took part in this survey study. 164 were collected via e-mail and 29 were collected on hardcopy form, from 400 delivered. It presents a 48% from distributed surveys.

Results.

Demographics. Demographics part consists of respondents' age, gender, education level, their positions in the company and the time spent in that position. 93 of the participants were female and 100 were male. Participants' education level is quite high, 110 of them have bachelor degrees, 52 have master degrees, and 5 doctorate degrees and 25 are with high school degrees. Most of the respondents are between 25 and 35 years old.

There are identified 31 managers, 18 engineers and 38 academicians when their positions are considered (Table 1).

Table 1. Positions in the company

Positions	Frequency	Percent
Academician	38	19.7
Accountant	15	7.8
Architect	2	1
Auto cad operator	1	0.5
Board Member	1	0.5
CEO	5	2.6
Consultant	1	0.5
Designer	3	1.5
Doctor	5	2.6
Engineer	18	9.3
Financial consultant	1	0.5
Firewall expert	1	0.5
Hair Dresser	1	0.5
Lawyer	1	0.5

Manager	31	16
Nurse	3	1.6
Officer	24	12.4
Owner	1	0.5
Pedagogy	1	0.5
Pharmacist	2	1
Psychology	1	0.5
Real Estate Agent	1	0.5
Registrar	1	0.5
Sales manager	5	2.6
Sales person	11	5.7
Secretary	6	3,1
Teacher	6	3.1
Translator	1	0.5
Worker	4	2.1
Total	193	100

Questionnaire Results.

According to the results, the respondents are quite agreed that they are able to accomplish their task, that they are well experienced and have necessary skills to complete their work. Furthermore, they are found to have good relationships with their supervisors (Table 2).

Table 2. Employee Self-Efficacy

EMPLOYEE SELF-EFFICACY	Mean	Std. Deviation
I can easily accomplish my tasks	3.84	1.085
I have the necessary skills to complete my tasks	4.15	0.862
I have good relationships with my supervisor	3.85	0.992
I am well experienced in order to accomplish my tasks	3.84	0.901

It can be concluded that human resources management support for employees in Bosnian and Herzegovinian companies is slightly negative in general. There is no arranged program or training to motivate or enhance job performance of the employees. Company managers are observed to not recognize the efforts of the employees. Furthermore, companies do not seem to have rewards to increase the work quality of the employees (Table 3).

Table 3. HRM S upport

HRM SUPPORT	Mean	Std. Deviation
My company arranges some programs to motivate me	2.90	1.033
My company arranges trainings in order to increase my job quality	2.98	1.063
My company has some rewards in order to increase the quality of my work	2.48	1.163
My company managers recognize my efforts	3.09	1.11

According to results, it is concluded that companies in Bosnia and Herzegovina mostly have the fairly supportive work environment. Respondents fairly agree that their supervisors make them relaxed, their companies provide them the opportunity to increase their career and their working

conditions are not hard. Moreover, it is shown that there is no established company policy to support their work (Table 5).

Table 4: Supportive Work Environments

SUPPORTIVE WORK ENVIRONMENT	Mean	Std. Deviation
Established company policies support my work	3.01	1.2
My supervisors make me relaxed	3.16	1.049
My working conditions are not hard	3.42	1.07
My company provides me the opportunity to advance my career	3.19	1.085

According to the response about satisfaction, respondents are very little satisfied in general with the organization and their career gained. They slightly feel themselves happy in the organization. Moreover, respondents are found to be not satisfied with their payment (Table 5).

Table 5. Satisfaction

SATISFACTION	Mean	Std. Deviation
I am satisfied with the payment	2.98	1.056
I am satisfied with my relationships with the colleagues	3.91	1.006
I am satisfied with the career that I had after working in this organizations	3.25	1.182
I am intrinsically well satisfied with my current organization	3.3	1.131
I feel myself happy in this organization	3.3	1.036

According to the results, respondent's internal motivators are identified to be very low. They are observed to slightly have special goals in order to finish their tasks and very weak motivation to complete their tasks without stopping. It is also identified that their motivation can easily be spoiled (Table 6).

Table 6. Internal Motivators

INTERNAL MOTIVATORS	Mean	Std. Deviation
Nothing can spoil my motivation	2.8	0.977
I have some special goals in order to accomplish my tasks	3.29	0.887
I cannot stop myself without completing my tasks	3.66	0.77

The results for external motivators revealed mixed agreement levels. The respondents are observed to be slightly happy with their payment. The appreciation of their managers is found to be highly necessary for the respondents. Furthermore, it is identified that they do not need something triggering them to start/complete their tasks (Table 7).

Table 7. External Motivators

EXTERNAL MOTIVATORS	Mean	Std. Deviation
My payment motivates me	3.38	1.165
It is very important for me to get the appreciation of my managers	4.05	0.836

I need something from external environment in order to start/complete my tasks	2.9	0.979
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According to the results, it is observed that the respondents are moderately committed to their organizations. They are thinking the benefits of their organizations more than their individual benefits (Table 8).

Table 8. Commitment

COMMITMENT	Mean	Std. Deviation
I cannot stop myself thinking the benefits of my organization in every task	3.74	0.904
The benefits of my organization comes first compared to mine	3.56	0.969

According to the results, it is detected that the respondents are fairly agree that they are trying to be in every part of job and are glad to be involved in overall organizational job. However, they are agreed that they don't feel good if they do not have duty in an organizational task. Moreover, respondents completely agree that they are glad to see their organizations success (Table 9).

Table 9. Involvement

INVOLVEMENT	Mean	Std. Deviation
I will be happy when I involved the overall organizational job	3.18	0.875
I try to be in every part of the job	3.13	0.905
I feel worse if I am not in the tasks to be completed	3.75	0.723
When I see my organization's success, I will be happy	4.35	0.686

According to results, respondents extremely agree that the quality, efficiency and effectiveness of their work enhances if they are motivated. However, they are slightly agreed that the cost decreases when they are motivated (Table 10).

Table 10. Individual Benefits

INDIVIDUAL BENEFITS	Mean	Std. Deviation
When I am motivated the quality of my work increases	4.23	0.755
When I am motivated the efficiency of my work increases	4.22	0.741
When I am motivated the effectiveness of my work increases	4.19	0.741
When I am motivated the cost of my work decreases	3.47	0.865

According to the results for the questions about organizational benefits, the respondents agree that they need to be motivated to improve the quality, efficiency and effectiveness of organizational work and to decrease organizational costs (Table 11).

Table 11. Organizational Benefits

ORGANIZATIONAL BENEFITS	Mean	Std. Deviation
When I am motivated the quality of organizational work increases	3.72	0.831
When I am motivated the efficiency of organizational work increases	3.74	0.774
When I am motivated the effectiveness of organizational work increases	3.72	0.746
When I am motivated the cost of organizational work decreases	3.47	0.793

Conclusion.

The study has been motivated by the need to explore the current situation about Human resources management in Bosnian and Herzegovinian practice. The results showed that human resources management in Bosnia and Herzegovina is in low level in general. According to the results, changes are necessary. The overall results provide positive agreement level except human resources management support. However, the findings could not bring strong agreements for all the remaining considered variables. The respondents seem to have strong benefits when they are motivated. But, according to the results, the organizations cannot get as much as the employees individually can. This may be the consequence of their weak satisfaction, involvement and commitment levels. The results revealed weak motivators (both external and internal) for the employees and work environment's supportive power. On the other hand, the respondents feel themselves comfortable in terms of their self-efficacy (Table 12).

Table 12. Overall Variables

Measures	Mean
EMPLOYEE SELF-EFFICACY	3.92
HRM SUPPORT	2.86
SUPPORTIVE WORK ENVIRONMENT	3.19
SATISFACTION	3.34
INTERNAL MOTIVATORS	3.25
EXTERNAL MOTIVATORS	3.44
COMMITMENT	3.65
INVOLVEMENT	3.60
INDIVIDUAL BENEFITS	4.02
ORGANIZATIONAL BENEFITS	3.73

According to Niu (2010), human resource managers prepare the personnel in order to enhance their efficiency and effectiveness. Moreover, higher levels of self-efficacy can bring in higher degrees of career commitment (Niu, 2010). The results show that Bosnia and Herzegovina has educated people and professionals, with the necessary skills, improved human resources strategy can bring more individual and organizational benefits.

According to the literature payment is the major effect on employees satisfaction (Boselie & Wiele, 2002; Yang, 2011). The results of this study also provided that employees are mostly motivated with good payment; moreover for Bosnian and Herzegovinian employees, appreciation of company managers is also identified to be very important.

The main limitation of this study is that it could reach only 193 respondents from different companies in Bosnia and Herzegovina. Future studies may involve the employees of similar organizations or in similar positions.

It can be suggested that Bosnian companies should mainly develop human resources strategies and enhance the functions and effectiveness of human resource departments.

Furthermore, despite the remaining issues provide positive results, they are detected to be very weak. Bosnian companies should also consider the discussed issues in this paper.

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Published in the Russian Federation
European Researcher
Has been issued since 2010.
ISSN 2219-8229
E-ISSN 2224-0136
Vol. 75, No. 5-2, pp. 980-989, 2014

DOI: 10.13187/issn.2219-8229
www.erjournal.ru



Philosophical Sciences

Философские науки

UDC 12

Building a Consonance Between Religion and Science: an Antidote for the Seeming Conflict

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Abstract. It is commonly argued by a school of thought that there is no relationship between religion and science. This extreme position has led to a lasting conflict, which has pitched religion against science and science against religion. The attempt in this paper is to articulate the fact that there can be an enduring consonance between religion and science. No doubt, the conflict and debate on the subject of religion and science has taken the front burner in both religious and philosophical discusses. Some scholars have argued that science has no role in religious or theological domain, while others contest that all religious concerns and considerations must be exposed to empirical investigations, and, proven by the dynamics of our intellect or reason. This paper, therefore, attempts to examine how religion and science complement each other. The author applied philosophical, sociological and historical methodology in his research. It is recommended that there is the need for dialogue between religion and science.

Keywords: antidote; consonance; conflict; religion; science.

Introduction.

The challenge posed by the continuous contention between science and religion has led to a wide dichotomy. This has consistently orchestrated and fanned the ember of disagreement and disunity between science and religion. On this premise therefore, it is contested whether there can ever be a meeting point between science and religion. The consequence of this argument is hinged on the fact that where ever the “pendulum swings”, would determine the obstinacy canvassed by the different schools of thought. That is, the extreme positions of strong conflict and that of mild disagreement. There is the position of compromise and dialogue, which is canvassed by this paper.

This paper, among other objectives, is poised at examining the areas of conflict between science and religion. Another objective of the paper is to examine how this conflict can be resolved. In addition, the paper would also consider the positions of some scientists, philosophers and theologians on the issue of the conflict between science and religion. The consequence of this would be to build an enduring consonance between science and religion. This position is expected to bridge the existing gap between science and religion, thus forging the desired depth of dialogue and co-operation. The paper, in establishing the right premise and building an enduring position, would begin by examining what religion and science represent. This would be elucidated by the writer as he considers what science is

and what religion is. This approach, no doubt would give the desired comprehension concerning the objectives set out by the writer.

What is Science?

The word science etymologically is from the Latin word, *scientia*, which means knowledge (Online Etymology Dictionary, 2014). On this note, Wilson (1998) submitted that it is “a systematic enterprise that builds and organizes knowledge in the form of testable explanations and predictions about the universe.” It can be deduced from this definition that the body of knowledge considered by science can be explained rationally and logically applied. This is also supported by Zimmermann and Britt (2012), who opined that science is a systematic and logical approach to discovering how things in the universe work. They further opined that there is a sharp dichotomy between science and the humanities. On this note they declared that the basic aim of science is the establishment of measurable results through testing and analysis. This, they contested, is due to the fact that science is based on fact, and not necessarily on opinions and preferences. This is why the scientific process is designed to challenge ideas through research; they further argued (Zimmermann and Britt, 2012). The writer would define science as the acquisition of knowledge about the universe and building such into testable laws and theories. The one who is involved in the application of scientific method in the collection of measurable, empirical evidences in the conduct of a research is referred to as a scientist (Wilson, 1998).

In most scientific approach or method, there are basic steps as elucidated by Zimmermann and Britt (2012). They include the following steps among others:

- (a) Make an observation or observations.
- (b) Ask questions about the observation and gather information
- (c) Form a hypothesis. This is actually a tentative description of what is been observed and make predictions on that hypothesis.
- (d) Test the hypothesis and predictions in an experiment that can be reproduced.
- (e) Analyze the data and draw conclusions, accept or reject the hypothesis or modify the hypothesis if necessary.
- (f) Reproduce the experiment until there are no discrepancies between observations and theory.

As a follow-up to this, they further argued that there are key underpinnings to the scientific method. They argued that this includes the followings: first, the hypothesis must be testable and falsifiable. Second, the research must involve deductive reasoning and not inductive reasoning. This means that true premises should be used to reach a logical true conclusion. Lastly, the experiment should consist of both dependent and independent variables, with the establishment of an experimental group and a control group. The author agreed with the fact that there are several empirical dynamics involved in scientific methodology. This, in the opinion of the writer may be responsible for the dichotomy that is often demonstrated by science with regards to religion. It can be clearly stated that most religious phenomena are not subjected to this deep level of scientific methodology or investigation. The argument to be advanced in this regards would be whether this could be seen as a logical *alibi* for accepting or supporting the conflict between science and religion. In arriving at any far position, it is relevant to consider what religion is. This would enable us to comprehend if the position of religion also involve some logical dynamics that would lead us to the desired truth.

What is Religion?

It is safe to concede to the fact that religion does not have a universal and generally accepted meaning or definition. However, there are various definitions ascribed to the term religion. According to Obilor (2002), he defined religion as the whole complexes of attitudes, conviction, and institutions through which we express our deep fundamental relationship with reality and not excluding the created order. On his part, Odumuyiwa (2006) defined religion as man's effective desire to be in right relationship with the transcendent order, controlling human destiny and events, either a prescribed system of beliefs and rituals. It is also the position of Omoregbe (1993) that religion is essentially a relationship, a link established between two persons, namely, the human person and the divine person believed to exist. Religion can also be defined as man's expression of deep belief in a transcendent being, and living in obedience to the moral demands of that being, requisite of an ideal society (Omomia, 2011). Although the list of the various definitions

of religion is in exhaustive, it can be safely argued that religion deals basically with a set of beliefs held by a particular group of people. This may have been responsible for the deferent religions as different people hold to different set of beliefs. Some common religions include Christianity, Islam, Hinduism, Buddhism and Judaism. There are definitely many other religions.

The underlining factor in the belief system expressed in religion converges at faith. In this instance, Craig (2010) declared that the word faith, which is a noun in modern English, is derived from the Latin word *fides* and *fido* which means faith and to trust. The Latin word is also derived from the Greek words *pistis* and *pisteuo*. This description of faith signifies the belief in the truth concerning a particular thing that may not necessarily be provable by empirical or rational means or methodology. This sets religion distinctly from science.

However, it must be noted that religion, in spite of its approach, is also preoccupied with arriving at the truth. This could also be said to be the main goal of science as she applies empirical methodology. The ultimate could be that religion and science are working towards the same goal but applying different methods. The latter applies the dynamics of faith while the former applies empirical methodology. Could the differences in their methods justify the orchestration of conflict? Must religion be subjected to scientific and empirical method of inquiry before she could be seen as arriving at acceptable truth or propositions? Should science consistently demand that religious phenomena can only be considered as authentic if they are subject to empirical investigations and inferences? Must science see religion as antagonistic as she makes demands on religion to appreciate the implications of blind dogmatism? Could science appreciate the fact that there are some religious experiences and expressions that cannot be exposed to scientific investigations?

The queries that should be addressed by science and religion in order to achieve the right level of dialogue and consonance are in exhaustive. Although this paper would not implicitly or explicitly address all the questions earlier on highlighted, albeit, her position would be a modest attempt to deal with the issues and pave the right way for an enduring compromise between science and religion. The writer gives cognizance to the fact that there is a seeming contrast between science and religion. It could safely be argued that this seeming contrast may have been misunderstood, and exploited by both proponents as they continue to widen the gap between science and religion. It is important to consider these seeming differences as this would serve as the right panacea towards the quest for an enduring consonance.

Seeming Contrast between Science and Religion.

The attempt in this subsection is to establish the fact that though the method and aims of science and religion appear to be different, the contrast should not engender any conflict. However, it is important to acknowledge the fact that these differences exist. A clear knowledge of their prevalence should rather cement the bond of unity and dialogue between science and religion. It is obvious that science, by its methodology, is linked to the material, while religion is linked to the spiritual. What then are some of the seeming contrast between science and religion? They include the following:

1) Science could be said to be objective, as it relies on experimental methodology. While religion is subjective, relying on experience.

2) Science deals with the material world while religion deals with the supernatural.

3) On the other hand, science believes on things that can be proved, while religion is concerned with ideas that have to be accepted without empirical proof.

4) Science depends mainly on reason, while religion depends on intuition. The approach of science is in the laboratory while religion operates within the recesses of man's personal experiences.

5) It could be commonly argued that science is analytical while religion takes for granted the reality. This makes the path of religion to be metaphysical, in most cases.

6) The truths of religion could be said to be the property of the one who experiences them through his inward soul. On the contrary, scientific truths are said to belong to the whole world as they add to the universal store of knowledge.

7) Religion is said to be as old as mankind. It could be rightly acknowledged that man had an idea of the supreme higher power even in the earliest time. On the contrary, the Sample essay on the relation between Science and Religion (2014) declared that science is of more recent growth.

It further argued that the earliest phases of science may not be more than four or five years old, while modern science began only in the 15th century.

8) It is commonly argued that science is not able to answer the fundamental questions of the mystery of life and death. It is mostly from religion man seeks answers to these realities.

9) Religion is acclaimed as been able, to a large extent, to answer the question of the "First Cause." This brings man clearly to the idea of religion.

10) Neither science nor religion could claim absolute monopoly of knowledge with regards to all aspects of man's experience and the universe.

From the foregoing, it may be tempting to conclude that there is no conflict or there should be no conflict between science and religion. This assumption may be prone to several discrepancies when the present relationship between science and religion is examined critically. It may appear safe to assume that there should be no conflict between them. This is likely premised on the fact that their goal could be said to be the same, in spite of the different approaches applied by them. The question that arises and demands an objective response is: Can it be rightly claimed that there is no conflict between religion and science? The clear response to this question can only be addressed as the position canvassed by various authors and the position shared by this writer are clearly articulated and objectively reappraised.

The Position of some Scientists and Theologians on the conflict

The events that took place in Europe especially at the time of the experience of Galileo Galilei during the scientific revolution and the Enlightenment Age led scholars like John Draper to postulate the thesis conflict. This holds that religion and science conflict in respect of methodology and also factually and politically. Other contemporary scientists advanced the conflict thesis. They include Richard Dawkins, Steven Weinberg and Carl Sagan. There were other scientists who also supported the conflict thesis. These were actually creationists (Russel, 2002; Shapin, 1996; Brooke, 1991 and Ferngren, 2002).

The above position is further articulated by Bailey (2014). This is encapsulated by the declaration he made concerning the position of some theologians and scientists. He argued:

Just as the public broadly perceives scientists as completely opposed to religion; many also believe that major theologians are utterly opposed to science in general and to evolution in particular. While some theologians still see science as the mortal enemy of religion, numerous other theologians see no fundamental conflict with science in general, or with evolution and the creation scriptures in particular.

The position of some theologians with respect to the conflict between science and religion was highlighted by Bailey (2014). Some of the theologians include: Ian Barbour, a Presbyterian scholar and recipient of the Templeton Prize. In his submission, he declared that science and religion are often seen as enemies locked in mortal conflict. According to him, some people in both camps are aggressively continuing the warfare, particularly on the topic of evolution. But the conflict can be avoided. The two kinds of inquiry offer complementary perspectives on the world, separate and independent from each other and not in conflict. The second one is John Haught, a popular American philosopher who is also a Roman Catholic. In expressing his position concerning the conflict, he declared that, both science and religion ultimately flow out of the same radical eros for truth which lies at the heart of our existence. In other words, he opined that it is as a result of their shared origin in this fundamental concern for the truth that we may never allow them simply to go their separate ways. On his part, John Polkinghorne, an Anglican Priest, a physicist and a British theologian, argued that science and theology share one fundamental aim, which will always make them worthy of the attention of those imbued with intellectual integrity and the desire to understand; in their different ways and in their different domains, each is concerned with the search for truth. In itself that is sufficient to guarantee that there will be a fruitful developing dialogue between them.

The position also canvassed by Pope John Paul 11, concerning the conflict is quite instructive. He surmised that, the Bible itself speaks to us of the origin of the universe and its make-up, not in order to provide us with a scientific treatise, but in order to state the correct relationships of man with God and with the universe. Another Anglican Priest and a British Philosopher, Keith Ward, concluded that, claims on both the religious and scientific sides to give an all-encompassing and exclusive view of truth will bring religion and science into conflict. The above positions identified by

Bailey (2014) represent the perspective of some theologians and scientists concerning the conflict between science and religion.

It is appropriate to examine the position of some scientists who also shared outstanding religious inclination. Their religious linings had great effect on their perception of science, consequently, their position with respect to the conflict between religious and science. In addressing their position, Brown (2014) examined the following: The first to be considered among them is Robert Boyle. His gas law is very familiar to students of chemistry and physics. He was a fellow of the British Royal Society, and was known for his piety, benevolence and promotion of the circulation of the Bible. In spite of his scientific activities, he published five major religious works and instituted lectures annually in defense of Christianity. It is on record that Boyle stated that the “vastness, beauty, orderliness of the heavenly bodies, the excellent structure of animals and plants, and the other phenomena of nature justly induce an intelligent and just observer to conclude a supremely powerful and just author.” This is a clear indication that Boyle believed in God, thus was religious.

Another notable scientist was Michael Faraday. He is the acclaimed originator of much of the knowledge we have about electricity. Faraday is said to have made a public profession of the Christian faith at the age of thirty. To authenticate his faith, Faraday, at the close of his life, declared: “I am not resting my dying head on guess work. I know whom I have believed, and I am persuaded that He is able to guard that which I have committed unto Him against that day.” In the opinion of the writer, this is a clear indication that Faraday had a robust relationship with God. Consequently, it can be rightly concluded that he was not against religion. In the same vein, Brown (2014) submitted that Sir Isaac Newton was another notable scientist who also accepted religion. Newton is considered by most scientists as one of the greatest minds that the human race has ever produced. He did many noble works in physics, hence physics is said to be seen as science due to his work. From the religious sphere, he is said to have written several divine tracts. He also wrote six major theological works, which included a complete church history and both *Observations on the Prophecies of Daniel and the Apocalypse of St. John*. These books were popular and often used as reference materials by other theologians.

The list of other notable scientists who embraced religion also included James Clerk Maxwell. He is adjudged as the one who gave the world the mathematical theories of electricity and magnetism. It is on his invention that most modern electrical communication is based. His words could be clearly seen as his motto. He declared: “The only desire which I can have is like David, to serve my own generation, by the will of God.” Maxwell was definitely deeply religious even as a scientist. Another notable scientist was Lord Kelvin. His name appeared in most introductory and advanced textbooks on electricity and thermodynamics. Though a scientist, Kelvin was a devout Christian.

The list of notable scientists who also embraced religion is in exhaustive. Others include Charles P. Steinmetz, R.A. Millikan and A.H. Compton (Brown, 2014). They all expressed outstanding faith in God. This is exemplified by the statements accredited to them with regards to religion. Steinmetz, General Electric Company scientist did the pioneering work on alternating current electric power equipment. He also authored several textbooks on standard electrical engineering. In spite of the accolades he won as a scientist, Steinmetz was a devout man. He declared: “The greatest power of all is in our midst unscratched today. I refer to spiritual power that comes through right living and worship.” Following after his heel is Millikan. He won the Nobel Prize in 1923. He did not allow his scientific achievements to dwarf his belief in the divine power of God. Another scientist, who also won the Nobel Prize in 1927, was Compton. He was highly religious. He demonstrated this in his description of the atom. He exclaimed: “A God who can control the universe like that is too great for comprehension.”

The writer wonders why any conflict should exist between religion and science, especially with the position maintained by the scientists who were considered earlier on. It is obvious that their scientific prowess and achievements did not contradict their religious inclinations and persuasions. To some extent they could be said to have acknowledged the fact that their inspiration and scientific achievements could rightly be tied to the divine. The writer is of the opinion that the entire conflict may have resulted from the extreme position canvassed by some men of science and theology. It is suspected that they both took extreme and uncompromising positions. This would have likely pitched science against religion and religion against science. The nature of the conflict would be addressed in the subsequent section.

The Conflict between Science and Religion.

It was established earlier on that science is concerned with objective observation and verification of physical reality, while religion is based on subjective belief system which is based on faith. The writer is of the opinion that the different approaches employed by science and religion in unraveling the reality and the universe may have pitched them against each other. According to Hall and Hall (2014), "science and religion are diametrically opposed at their philosophical levels. And because the two worldviews make claims to the same intellectual territory-that of the universe and humankind's relationship to it-conflict is inevitable." This position presupposes that that difference in approach and paradigms has continued to enhance the deep dichotomy between religion and science. Does this claim actually elucidate the entire situation? In other words, could it also be accepted as a genuine justification for the conflict?

There is the popular view that it was about the 1800s that the relationship between science and religion became a formal topic of discourse. Before this time, no one actually pitched religion against science or science against religion. However, Haarsma (2014) opined that the idea that science and religion are fundamentally in conflict with each other has been around for well over a century. The following positions expressed by some advocates of science have fanned the ember of conflict between science and religion. It is arrogantly positioned by Atkins (1995) that "science and religion cannot be reconciled, and humanity should begin to appreciate the power of (science) and to beat off all attempts at compromise. Religion has failed, and its failures should be exposed. Science, with its currently successful pursuit of universal competence... should be acknowledged the king." An attitude of opposition was also originally expressed by Draper (1875). He surmised, "A divine revelation must necessarily be intolerant of contradiction, it must repudiate all improvement in itself." The position expressed by White (1896) puts the sharp conflict between science and religion, as held by some scientist, succinctly. He made his clear submission thus: "Hardly a generation since (Galileo) has not seen some ecclesiastic suppressing evidence, or turning expressions, or inventing theories to blacken the memory of Galileo".

In the writer's opinion, the conflict that exists between science and religion, be it perceived or real, could be said to have been orchestrated by some of the statements attributed to the proponents of the existing divide. The above statements are some clear examples. The notable irony in the entire scenario is that some people hold the opinion that the tension is real, while others believe that it is an illusion. These positions are clearly captured by Sappington (1991). He posited that "since the time of Copernicus, people have talked of a tension between science and religion. Some, who believe that a true religion should be supported by science, believe the tension is real. Others believe that the tension is illusory and based upon a misunderstanding about the nature of both science and religion." No matter the position presented by the different proponents, there is the clear indication that a seeming conflict exist between religion and science.

The above argument is further supported by Haarsma (2003). He posited that, it is necessary to acknowledge that there have been, and continue to be, some conflicts between scientific and religious claims. Although he tried to exonerate religion from the treatment meted against Galileo by the church, it is no gainsaying the fact that, this, to a large extent, was one of the major events that marked the turning point in the hostility between science and religion. This is attested to by the position of Russel (2002), Shapin (1996), Brooke (1991) and Ferngren (2002). They put their argument succinctly: "Events in Europe such as the Galileo affair, associated with the scientific revolution and the Age of Enlightenment, led scholars such as John William Draper to postulate a conflict thesis, holding that religion and science conflict methodologically, factually and politically. This thesis is advanced by contemporary scientists such as Richard Dawkins, Steven Weinberg and Carl Sagan, and proposed by many creationists." It is important to mention, however that most scientists, theologians and philosophers do not feel there is any conflict between their faith and science. Does their position in any way negate the existence of a conflict between religion and science?

It is common knowledge that in the seventeenth century there arose a significant conflict between science and religion. This was centered on Galileo Galilei. The commonly held opinion was that the earth was at the centre of the universe. However, Galileo's study of motion and other observations, with his microscope, led him to advocate the same idea with Copernicus. He postulated that the sun was at the centre and both the earth and other planets revolved round the sun. The contrary view which had held sway for a long time within the church was held as the correct one, while both the position of Copernicus and Galileo were seen as heretical (Brown, 2014). On examination by the Inquisition under

the menace of torture, as instituted by the Holy Office of the papal church, Galileo was made to recant his Copernican views and sentenced to imprisonment at the pleasure of the tribunal. It should be noted that, although the threatened imprisonment was not carried out, Galileo, spent the last years of his life in strict seclusion (Brown, 2014). This level of dogmatic religion may have overtly contributed to the conflict between religion and science.

Another notable event that may have orchestrated the conflict between religion and science was the position maintained by Charles Darwin. In a simple sense, Darwin postulated that there was natural selection and this accounted for the different organisms both animals and plant. This view was seen as a great negation of the creation account in the Bible. The ideas of Darwin, in the nineteenth century definitely precipitated a notable conflict between scientists and religious proponents. As a naturalist, Darwin inclined his position to nature, where he laid emphasis on the book of nature, which to a large extent was contrary to the position held by religionists. Although it is not within the scope of this paper to discourse Darwin's theory, suffice it to say that he emphasized on survival of the fittest, and the advancement from simple to complex. This gives an incline, that though Darwin did not out rightly discuss evolution, but his theory shares some commonalities with evolution. It is the view of the writer that the church took a very oppressive attitude towards Darwin's theory, and this further widened the gap of 'friendship' between religion and science.

Categorizing the interactions between Science and Religion

There is the possibility of building different level of interactions between religion and science. The level of interaction and perception would determine the state of conflict and its intensity. A notable theologian, an Anglican priest and a scientist, John Polkinghorne, postulated four major categories of the level of interactions between science and religion. According to him they include the following: conflict between science and religion, independence of both positions, dialogue between them and integration of both into one field (Polkinghorne, 1998). There were other notable scientists and theologians who drew different typologies with regards to the relationship between science and religion. Some of them include Barbour (2002), Haught (1995) and Peacocke (1981) among others. Their position gave rise to distinct categorization that would be considered by the writer subsequently.

The following typologies have been identified with respect to the conflict between science and religion. It is important to note that the categorization is in exhaustive, as there are other forms. However, they all converge at similar categories as the one identified herein:

1) Incompatibility: This typology commonly holds that both science and religion are incompatible. According to Tyson (2014), there exist a central difference between science and religion, and these claims are irreconcilable. He argued that science relies on experimental verification, while religion relies on faith, and both are irreconcilable paths to knowledge. This position is supported by Stenger (2000). He posited that science and religion are incompatible due basically to the conflict between approaches of knowledge. The approach of Dawkins to the depth of incompatibility is quit aggressive. Dawkins declared that "he is hostile to fundamentalist religion because it actively debauches the scientific enterprise. This, according to him means that religion subverts science and saps the intellect" (Dawkins, 2006). The extreme of incompatibility between religion and science, in the opinion of the writer, would continue to widen the gulf between them.

2) Conflict theory: This theory was made popular in the nineteenth century by John William Draper and Andrew Dickson White. Their positions that religion and science has been in conflict continuously throughout history (Numbers, 2009). This position pitted science against religion and religion against science. It often justifies its position on account of the trial of Galileo Galilei by the church, and the attitude towards Darwin's theory of natural selection.

3) Independence theory: This view was made popular by Gould (1999) and Stace (1952). In his view, Gould declared that science and religion deal fundamentally with different aspects of man's experience, therefore when they remain in their different domains, they can then co-exist peacefully. However, Gould's view was from the perspective of science. On his part, Stace viewed the independence from the perspective of philosophy of religion. He maintained that when science and religion are viewed from their different domains they are both consistent and complete.

4) Both have parallel methods: In an attempt to establish his position on the aspect of parallels in method between science and religion, Barbour (1968), asserted that that science is made up of paradigms based on cultural traditions and this is similar to the view on religion. In other words, Polanyi opined that science operates within moral commitments similar to those

found in religion. (Barbour, 1968). Another parallel can be seen in the act of research by the scientist. It is actually faith that keeps the scientist during his research and investigation. According to Mckinlay (2010), it is natural often times for man to reason according to presupposition. This means that those who are engaged in scientific investigations base their results on assumptions, and their conceptions are based on their preconceptions. It can be concluded, on the strength of this argument that assumptions are simply faith, by another name. The scientist also demonstrates faith, which is a core part of religion, in his investigation of reality and phenomena. The writer believes that this is a strong demonstration of parallel method between religion and science.

5) Dialogue theory: This has grown in a formidable community of scientists, priests, theologians and clergymen. They believe in the intersection between science and religion. Their efforts have led to prominent role by institution and journals have also been developed to address the relationship between science and religion. According to Hefner (2008) and Scott (1998), there is the need to incorporate theologians and others who have healthy respect for science. The writer argued that this should also be extended fully to scientists who express morbid antagonism towards religion.

It can be inferred from the typologies examined above that the level of antagonism between science and religion is contingent on the level of interaction acceptable to the different proponents. The writer is of the opinion that any attempt to also assess one typology above the other may engender another form of conflict. What then is the way out of the imbroglio? The writer believes that it is possible to build a formidable consonance between science and religion. Accessing this possibility is the main concern of the subsequent section.

Building an enduring consonance between Science and Religion.

It can be logically argued that lack of uniformity should and must not necessarily lead to disunity or acrimony and rancor. The fact that religion and science employ different methodologies in arriving at the truth and reality should not be explored as an alibi for engendering conflict and rancor. The writer believes that both can exist side by side and also benefit from each other. The attempt in this closing part would be to advance some panaceas that would serve as precursors for the desired relationship and friendship between science and religion. This would cement the seeming gulf of conflict between them. The followings should be considered:

1) There is the need for consistent dialogue between the proponents of science and those of religion. This will enable each to demonstrate tolerance and respect for each other's position.

2) They can learn from each other, as they appreciate their individuality, yet in a unique relationship.

3) Religious proponents should seek to apply the dynamics of science towards the expression of their religious beliefs. This means that the contemporary reality demands that our faith must embrace "works." This means a demonstration of tangible reality.

4) There is the need to eschew dogmatism in order to have a clearer comprehension of the dynamics of religious reality. Genuine questions should be tolerated by religion and she should be humble enough to concede that she may not have answers to some realities.

5) Science should humbly concede that she is not the harbinger of all wisdom and knowledge. There are definitely some levels of knowledge that can sincerely be addressed by religion alone.

6) Science should appreciate the fact that the major difference between her and religion is the methodology towards establishing the truth or reality. The consequence of this is that though their methods may differ, both science and religion are working towards unraveling the truth. This would consequently establish the knowledge they seek to propound.

7) There no gainsaying the fact that some religious experiences cannot be exposed to the scrutinizing of scientific empiricism. This means that most religious experiences cannot be taken to the laboratory for empirical analysis. They can only be appreciated under divine and subjective comprehension and appreciation.

8) As a follow-up to above consideration, it should be conceded by science that that because something is improvable does not necessarily means that it is untrue. The religious teaching often describes the spirit realm, which is inhabited by spirit creatures. This can neither be proved nor disproved. In most cases it subsists at the realm of faith.

9) Religion must appreciate that science affect the way man views the world. Science is definitely a part of our daily life. This ranges from medicine to engineering and others.

Conclusion.

As the author canvasses a continuous compromise between religion and science, it is instructive to consider the position aptly expressed by Nelson (2011). He submitted that: "Science and true religion complement each other rather than contradict each other. Both science and religion involve the search for the truth." He further argued that "Science helps us discover the world's magnificent design. While true religion helps make these discoveries more meaningful by teaching of a creator that lies behind the design." It is appropriate to declare that religion and science should eschew all forms of conflict and work towards an enduring consonance. This definitely would lead to a symbiotic co-existence. This definitely would likely engender scientific progress bathed in moral fiber. This position had been canvassed by some scientists and theologians that were considered earlier on.

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Published in the Russian Federation
European Researcher
Has been issued since 2010.
ISSN 2219-8229
E-ISSN 2224-0136
Vol. 75, No. 5-2, pp. 990-996, 2014

DOI: 10.13187/issn.2219-8229
www.erjournal.ru



Pedagogical sciences

Педагогические науки

UDC 37

Level of Posture of Pupils in the Age of Elementary Schools

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Abstract. The article presents primary information about conditions and qualities of posture of pupils in the 4th grades in the cities L. Mikuláš and Ružomberok. In terms of method of data collection, we have chosen standardized method of evaluating posture for clinical and pedagogical practice. We have found that girls ($\chi^2 = 12,132$; $p < 0,1\%$) as well as boys ($\chi^2 = 10,283$; $p < 0,1\%$) have poor postures which we define as III. qualitative group of posture evaluation. Significantly ($p < 0,1\%$) problematic areas are already defined of the period of life include areas of arms and position of the shoulder blades, as well as the head. Listed partial discoveries are included in the grant: VEGA no. 1/0376/14 Intervention as physical activity as health prevention of Slovak population.

Keywords: posture; musculoskeletal system; age of pupils in elementary schools.

Introduction.

One of the areas of the health is musculoskeletal system where postures have become negative syndromes, respectively diseases of civilization nowadays.

Véle (2006) understands musculoskeletal system holistically which performs its basic functions such as: a) locomotion, b) postural, c) communication, d) manipulation (creative), e) as a basic life function (respiration, nutritional). What is more, it seems to be a sensitive mirror in which reflects dysfunction of the various systems of the whole organism such as viscerovertebral and vertebrovisceral syndromes (Vaňasková, Tošnerová, 2006).

The posture is a result of certain shape and function of the spine (especially work of the postural muscles, postural reflexes). It is a feature of every activity and what is more it is activity, motion habit which we are largely able to control by our own willpower (Čermák et al., 2005; Velé, 2006).

According to Kubáta (1993) at the average of 50 % of school youth have poor postures. Current research results of posture but also of muscular system are alarming. In more than a half of monitored pupils in age of elementary school was found poor postures and its evidence is increasing with age Kováčová (2003), Kopecký, 2004; Bekö, Medeková (2006), Šeráková (2006), Bartík (2006, 2007, 2013), Kopecký, Ely (2007), Hubinák (2007), Medeková, Bekö (2009), Mikuláková, Trusová (2010).

Kinesiology understands posture as momental results of mutual arrangement of its various parts of the body (any change in one's locomotive segment invariably determines the entire chain of other changes). Proper posture is defined more as economical rather than aesthetic. It is optimal position of vectors in centred of the joints with the minimal of muscle activity in that posture (Buran, 2002).

Rýchlíková (1997) characterizes proper posture as the most optimizing layout of the various parts of human body in space in order to maintain balance, function of various organs and system of the body. While Kolář et al (2009) believes that posture is like a sign of human being, a concrete way of realizing of postural stereotype.

The opposite of the proper posture is poor posture which signs are reflecting in typical defects of postures (Čermák et al., 2005). The poor posture Labudová, Vajczíková (2009) understands as contravention of proper posture in which occurs wide variations of transitory nature (if they are of a permanent nature, it is a deformation of areas such as spine, joints, muscles and ligaments) which interfere into optimal vertical axis of body. Poor posture is not possible to offset by spontaneous movements therefore to left the posture to its natural development is very unreliable.

Incorrect, poor posture back pain, defects of movement stereotypes, premature development of degenerative joints (Janda, 1985; Thurzová, 1993a,b) most often occur during disruption and change in muscle balance which is often accompanied by muscle shortening which is based on the concept of functional disorders of movement system of muscle imbalance which reflects variations in posture and limited range of motion in the joints (Janda 1985 and Velé 2006).

The lack of primary prevention in childhood is often the result of vertebrogenic prevalence of disorders in adulthood in which it is sometimes impossible to remedy weakening. Furthermore, they are involved in the other functional and structural health disorders (Blizzard et al., 2000).

Aim.

To expand knowledge, find and point out level of musculoskeletal system with the intention posture for pupils in age of elementary school. In consideration of the prevalence of poor posture we assumed occurrence of functional disorders in posture for pupils in age of elementary school.

Materials and methods.

The examined group consisted of 229 pupils in age of elementary school from the central parts of Slovakia, areas around Liptov, which were willing to participate with their parents and teachers on this survey. They were the pupils in 4th grade in elementary school- 116 girls and 113 boys whose age average was- for girls 10.4 years old and boys 10.6 years old. The primary characteristics are showed in table 1. The survey was conducted in four primary stages in which during 2nd stage we asked for assistance of orthopedic doctor, parents and teachers. It was organized in the school year 2013/2014 during the 1st- 3rd week of February. We implemented evaluation of musculoskeletal system with the intentions of posture by Thomas- Klein method modified by Mayer in orthopedic clinic (Hošková, Matoušová, 2005).

Table 1. Group characteristics (n = 229)

n=229/ factors	Girls (n = 116)		Boys (n = 113)	
	Height	Weight	Height	Weight
	138,6 cm	36,5 kg	141,6 cm	39,2 kg
Age	10,4 years old		10,6 years old	
BMI	21,6		22,5	

Posture is divided into 4 stages: 1. Excellent, 2. Good, 3. Poor, 4. Incorrect where each stage of posture has 5 characters and each is rated by mark (1-4): 1. Posture of head and neck

2. Shape of chest
3. Shape of abdomen and pelvis inclination
4. Overall curvature of spine
5. Height of shoulders and positions of shoulder blades

Classification of posture:

- | | | |
|------|-------------------|---------------|
| I. | Excellent posture | 5 points |
| II. | Good posture | 6- 10 points |
| III. | Poor posture | 11- 15 points |
| IV. | Incorrect posture | 16- 20 points |

* Classification of lower limbs is written as index in the form of fraction. $I + II + III + IV / V =$ total points

To evaluate the qualitatively stages of posture of pupils in age of elementary school, we have used Chí – quadrat test on 1 % ($p < 0,01$) and 5 % ($p < 0,05$) level of statistical significance. Furthermore, we have been using methods of logical analysis and synthesis with usage of inductive and deductive methods, comparison and generalization. All data have been percentually processed, differentiated by the sex of the students and compared with the available literature.

Research results and discussion.

According to partial targets and tasks of the work, we are presenting part of the subjects which are parts of other monitoring and processing of the project. Stated results cannot be generalized therefore they must be understood in the overall context, as tentative and basis according to lifestyle and health of pupils in age of elementary school.

Overall posture. The level and quality of posture of pupils in age of elementary school shows table no. 2a, b where we found out following. Only 15 % of girls have excellent posture, 28 % have good posture and to 57 % have poor posture. Boys have 52 % poor posture, while good posture has 30 % and excellent posture have 18 %. Neither girls nor boys had been identified with incorrect posture which determines IV. qualitative stage. What is more, it has told us similar for girls ($\text{Chí} = 12,132$; $p < 0,1$ %) as well as for boys ($\text{Chí} = 10,283$; $p < 0,1$ %) that poor posture which is reflecting to III. qualitative group of posture. At the same time, we found 5 % difference between girls and boys in the evaluation of posture in III. qualitative group of disadvantage of girls.

Table 2a. Evaluation of posture of girls (n = 116)

Level of posture/ points	5 points	6-10 points	11-15 points	16-20 points
I. Excellent posture	15 %	-	-	-
II. Good posture	-	28 %	-	-
III. Poor posture	-	-	57 %**	-
IV. Incorrect posture	-	-	-	-

Legend: ** level of significance $p < 0,01$

Table 2b. Evaluation of posture of boys (n = 113)

Level of posture/ points	5 points	6-10 points	11-15 points	16-20 points
I. Excellent posture	18 %	-	-	-
II. Good posture	-	30 %	-	-
III. Poor posture	-	-	52%**	-
IV. Incorrect posture	-	-	-	-

Legend: ** level of significance $p < 0,01$

According to evaluations of posture individual segments, we have found the following.

The area I. Posture of head and neck. We have found out that the highest percentage was equally for boys (47 %) and girls (43 %) which was rated by mark 3. 27 % of girls and 20 % boys have been rated by mark 3 whose view has been with forward direction and the lower part of the jaw has been inserted. However the axis of the neck was slightly inclined forward and has been found in 30 % of girls and 33 % boys. We believe that it is related with muscular imbalances in individual reference sections as states Velé (2006). Therefore, in terms of prevention, we recommend to choose the appropriate positions at work, at school and at home, etc.

The area II. Shape of chest. We define a normal chest as symmetrical, its axis is vertical, well-sprung, ribs contain with spine 30° degree angle, symmetrical movement during breathing and thoracic kyphosis. This has been physiological found in 35% of girls and 31% of boys. Small variations from normal of the axis of the chest, has been found in 47% of girls and 53% of boys. Rated by mark 3 have been 8% of girls and 16% boys, representing only 2% difference of disadvantage of girls.

In the area III. Shape of abdomen and pelvis inclination. We have found that girls rated with mark 1- 17 %, mark 2- 34 % and mark 3- 49 % ($\chi^2 = 9,795$; $p < 0,01$). For boys it have been mark 1- 21 %, mark 2- 45 % and mark 3- 34 %. Level mark 4 has not been detected neither in girls nor boys. Abdominal area has been for boys and girls at that time prominent character of the transitional type. This condition refers to weakened muscle groups in that area (m. rectus abdominis and m. transversus abdominis), but also poor postural stereotype, which is reflected in lumbar lordosis Velé (2006). As we can see pelvic inclination and its controlling is important for the upper surface of the sacrum, which is the base for the above stored vertebrae. From its inclination in vertical position it depends on formation of lumbar lordosis and thus the upper parts of spine (Kolář et al., 2009).

In the area IV. Overall curvature of spine. We rated with mark 1- 20 % of girls and 29 % of boys. Small variations from normal have been presented in 37 % of girls and 39 % of boys. Obviously round, but also flat back has been observed 32 % of boys and 43 % of girls. The variation of children in age between 7-16 is very common (Wojcicka, 2002). Serious variations from normal have not been found in examined group.

In the area V. Height of shoulders and positions of shoulder blades. We have found complete symmetry, the same height of arms, released shoulders, not released shoulder blades and the inner axis parallel in 22 % of girls and 20 % boys. Slight variations have been found in girls (29 %) as well as in boys (38 %). Permanent protrusion of one side of asymmetry of figure, one arm above the other has been found in 49 % ($\chi^2 = 9,010$, $P < 0.01$) of girls and 42 % ($\chi^2 = 8,772$, $P < 0.1$ %) of boys. Moreover, significant gapping of shoulder blades, ejecting of large hips, asymmetry of thoracic-abdominal triangles in our group has not been found. Our results correspond with the results of Kania - Gudzio, Wiernicka (2002), Kováčová (2003), in which pupils

in age of elementary school have found that the highest rates are in the wrong posture involved by protruding shoulder blades, hips, shoulders and abdominal area, which is confirmed in its research Kováčová (2004).

We have specifically evaluated **the area of the lower limbs VI.** where we have recorded a significant difference between the sexes, in which we have found flatfoot II. - III. qualitative level. By mark 1 we have rated 42 % of girls and 39 % boys. The axis of the lower limbs has been correct in which the center of the hip joint, knee and ankle create vertical, arch feet have been perfect as well as longitudinal and transverse arches. By mark 2 we have rated 25 % of girls and 26 % boys, where varus or valgus knees has been greater (less) than 3 cm which mean that distance between the knee joints and ankles has been bigger than 3 cm. Feet has been slightly flat therefore mark 4 for which is characteristic of varus of knees 5 cm, 6 cm of valgus of knees while flat feet have been found in 2 % of girls and 4 % of boys. In conclusion, it is important to note that these findings are related to weight, but also the genetic components among pupils in age of elementary school stated Vojtaššák (2000).

Table 3 presents the percentage of functional disorders of posture for pupils in age of elementary school.

Table 3. Functional disorders of posture in pupils in age of elementary school (n = 229)

Sex/disorders	Kyphosis posture	Hyperlordotic posture	Hypolordotic posture	Scoliosis posture
Boys (n = 113)	32 %	24 %	5 %	39 %
Girls (n = 116)	33 %	32 %	4 %	31 %

We have found out that in boys (39%) and girls (31%) are the highest percentage occurrence scoliosis posture. Both findings are significant (boys - $\chi^2 = 7.021$, $p < 0.01$) and (girls - $\chi^2 = 6.636$, $p < 0.01$). Other functional disturbances have been observed in boys (32%) and girls (33%) are kyphosis posture. Hyperlordotic posture has been found in 32% of girls and 24% boys. Hyperlordotic posture has been found in 5% of boys and 4% of girls, which represent the lowest percentage in our study group.

Conclusion.

We can conclude a confirmation of the unfavourable tendency in condition and development of body posture, therefore in level of functional relations of muscles. Thereof we can infer reserves in adequacy and suitability of musculoskeletal load. Diagnosis of body posture rating proved increased share of disturbance of functional disorders among pupils in age of elementary school which is thus characterized and signified by ($p < 0.01$) III. qualitative degree – poor body posture in both sexes. Measured rates and their comparison with other rates presented as physiologically correct confirmed our hypothesis as well as this generally noted unfavorable trend. Especially alarming is an index proving the high occurrence of combined type of wrong body posture, which demonstrates bond of deviations, therefore fact which we mentioned above – one functional failure is usually compensated and conditional by another functional failure.

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УДК 37

Формирование осанки у учеников младшего школьного возраста

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Аннотация. В статье приведены первичные данные о состоянии и формировании осанки у учеников младшего школьного возраста, в четвертых классах г. Липтовский, Микулаш и г. Ружомберок. В качестве метода определения данных был избран стандартный метод квалификации осанки для клинической и педагогической практики, с его помощью было установлено, что как девочки ($Chí = 12,132$; $p < 0,1 \%$), так и у мальчики ($Chí = 10,283$; $p < 0,1\%$) имеют слабые осанки, относящиеся к III. квалитативной группе осанок. К сигнификативным ($p < 0,1\%$) проблемным областям, в указанном возрасте, относятся области плеч и положение лопаток и головы. Приведенные первичные показатели являются составной частью проекта-гранта ВЕГА: No. 1/0376/14.

Ключевые слова: осанка; двигательный аппарат человека; младший школьный возраст.

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Published in the Russian Federation
European Researcher
Has been issued since 2010.
ISSN 2219-8229
E-ISSN 2224-0136
Vol. 75, No. 5-2, pp. 997-1004, 2014

DOI: 10.13187/issn.2219-8229
www.erjournal.ru



UDC 378:371.134+78

Role of Creative Activity in the Formation of Professional and Personal Experience of the Future Music Teacher

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Abstract. This paper investigated and substantiated the role of creative activity in the formation of professional and personal experience of the future music teacher. It was determined that the creative activity as a complex personality formation acts as a prerequisite and the result of musical and educational activities, provides an unusual approach and creative solution of professional problems. It is proved that the high level of creative activity is determined by positive motivation, strong interest and focus on music and teaching activities, expression of emotions and significant willpower, self-reliance, initiative, imagination, the ability to perform the academic tasks in a non-standard way, and the availability of adequate self-assessment of one's own musical abilities and professional activities.

Keywords: creative activity; professional and personal experience; future music teacher; professional training.

Introduction.

The modern higher education, while training the teacher of a new pattern aims at training a professional capable of continuous spiritual self-improvement, and active teaching creativity as the basis for enriching the intellectual and cultural potential of the nation. The problem of effective training of a future music teacher acquires particular importance as a part of the structural reform of the higher education, modernization of educational programs, and implementation of innovative technologies in the educational process.

Formation of the creative activity of the future specialist becomes one of the factors raising the spiritual culture of the Ukrainian people, the comprehensive development of the student as a whole person, development of its abilities and talent, as well as professional and personal experience. The issue of shaping the creative activity of the future music teacher having its own teaching traditions and principles in higher school appears in a new light. This is due to progressive social changes, factors of scientific and technological progress and further development of the theory and practice of music education and training. The whole process of learning in higher school should be subordinated to the task of formation and development of the qualities and characteristics of the future professionals which would provide them with a productive and socially efficient level of professional and personal experience.

Problem of Research

Today the creative approach in professionalization acquires priority, and the principle of creativity embodies in the maximum focus on creativity in educational activities, learning one's own experience of creative activity, determines the effectiveness and efficiency of professional activity of the future teacher. This is due to the fact that the teacher's innovative approaches to teaching music and music education, development and implementation of new methods, techniques, and their optimal combination support the creation of innovative systems for teaching, training and development of students.

However, the system of training the music teachers faces considerable difficulties. The collected evidence suggests that reforming the content and technology of training the students of music teaching faculties of higher educational schools does not always affect the quality of their music education, level of their music and educational training and preparedness for musical and creative profession positively. The quality of training the future teachers is largely dependent on the student's position in the learning process and its innovative attitude to different learning activities.

The process of becoming a professional, the spiritual, moral and intellectual growth of future professionals is largely determined by the level of their activity. Mastering the creative music profession combines four components, i.e. cognitive, value-oriented, transformative and communicative, which form the basis for preparing students for their chosen profession.

Research Focus

The substantive aspects of creative activity as an integrative personal active formation combines the interests and needs, the direction and dispositions, the level of development of the intellectual, emotional, volitional qualities and actions predetermining the effectiveness of different types of students' activities. Determination of content of the creative activity as the most important feature of the modern professional music teacher assumes consideration of peculiarities of the students' age and structural components of personality. Students' age is a period of active formation of the internal need of the individual to match its aspirations with society interests. A number of studies proved that the most creative activity during music lessons is contained in independent musical cognitive activity promoting the intensive thinking, heavy use of memory and imagination (Bohoyavlenskaya, 1983; Pehota, 1997; Sysoieva, 1998). The dominance of creativity in education and development of the student's individual creativity can help the formation of the future professional teacher.

An important contribution to the theory and practice of formation of creative activity of the person by music subjects was made by Apraksina (1993), Nikitina & Romanenko (1992), Padalka (2008) and others who saw the music subjects as the effective means of personal development. The teacher's expertise and culture affect the formation of the future specialist.

The study of the issue of creative activity characteristics as an indicator of the level of formation of professional and personal experience of the modern professional is impossible without specifying its nature. We see the creativity as a complex personal formation, acting as a prerequisite and the result of musical and educational activities, and providing an unusual approach and creative solution of professional problems.

The works of authors considering the activity as a readiness (i.e. the ability and desire) to the active acquisition of knowledge (Maslow, 2003), expression of the transforming actions of the subject in relation towards the surrounding objects and phenomena (Kulnevych, 2001), a willed a condition characterized by the increased cognitive work of the individual (Molyako, 1989), effectiveness of the individual's vitality (Rybalka, 1996), quality of the work in which the personality is expressed with its attitude to the content, the nature of learning and the desire to mobilize the moral and volitional efforts to achieve the objectives of knowledge (Romanets, 2001) poses a significant interest.

Zhuhanov (1991) suggests considering the following three levels of activity:

Level one – reproductive activity – is characterized by the desire of the student to understand, remember and reproduce the knowledge, to master the way to use it according to the model. This level is characterized by instability of individual's willpower. The typical indicator of the first level of activity is the lack of interest in deepening the knowledge.

Level two – interpreting activity – is characterized by the desire to identify the nature of the music and educational material, to penetrate into the essence of the phenomenon, the desire to

know the relationships between the phenomena and processes, and to learn the ways to use the knowledge in changed conditions. At this level of activity, the student reveals the occasional desire for self-search for answers to the questions interesting to it.

Level three – the level of creative activity – is characterized by interest and desire not only to penetrate deeply into the essence of musical and educational events and their relationships, but also to find a new way to achieve the goal. At this level, the students show the desire to apply their knowledge in a new situation, i.e. to transfer the knowledge and ways of activity to the conditions previously unknown to them. The characteristic feature of this level of activity is a manifestation of high volitional qualities, perseverance, broad and persistent educational interests.

In the works of Zagviyazinskiy (1987) and Davydov (1996) the activity is characterized as a measure of active expression of the public essence of the expert as a quantitative and qualitative aspect of its career as a system of human impact on various aspects of life. In their view, training in higher education shall be directed towards formation of this complex personal formation as an indicator of the teacher's professionalism.

Lazarev, (1997) explores the "activity" as a human trait manifested in a state of readiness, in the pursuit of independent activity, choice of the optimal ways to achieve this goal as a means to meet the spiritual needs, interests, and personality expression, as an essential condition for improving the educational process.

Creative activity is an integrative personal active characteristic of a man, which predetermines the transforming creative direction of its intellectual and practical activity based on creative abilities, a high level of spiritual personality, expertise and creatively oriented motivation.

As convincingly demonstrated by the analysis of scientific papers, the basis of readiness for professional and creative activity (like any other) is the motivational component. In the framework of our research an important idea is that the environmental conditions provide only the opportunities to identify the creativity and the basic condition for the formation of creativity and its manifestations in everyday life is the development of individual's creative motivation. Therefore, we believe that the key pedagogical condition of forming the professional and creative activity of the future music teachers is the promotion of positive motivation of the educational and creative activity of students targeted for future professional activities.

Methodology of Research

General Background of Research

The purpose of the study included the investigation of the actual state of the creative activity of students of the theory and methodology of musical art department of the Art Institute of Borys Grinchenko University of Kyiv studying different academic courses, experimental verification of a set of didactic conditions improving the level of its detection by the future music teachers in the course of music and teacher training. To fulfill this objective it was required to solve the following problems, i.e. to identify the level of formation of creative activity of the future music teachers and the reasons hindering its positive dynamics; to explore the nature of the educational environment affecting the creative activity of students of various courses of study positively or negatively; to develop and implement the experimental verification of the effectiveness of teaching conditions ensuring the effectiveness of training in the development of this complex personality formation as an indicator of the degree of formation of professional and personal experience of the future music teacher.

The purpose and objectives of the study identified the need to use different methods, and the important place among them was occupied by the experiment that combined two stages, i.e. diagnostic and forming.

During the experimental work, we noticed that the traditional system of professional training of the future teachers in higher school can not fully meet the social demand for professionals with a high level of creative activity and readiness for creative professional activity. The task of a modern high school teacher is to change the subject paradigm radically for a student-oriented teaching, and thus to provide an environment for comprehensive detection of the creative potential of each student, to develop and consolidate its active professional position and creative style of its activities.

The task provided for re-orientation from the formal knowledge level to the level of personal knowledge so that students could be active, show a creative approach to solving the educational problems, improve their organizational skills, and gain the experience of innovative musical and educational activities in the process of music and teacher training. This task can be solved only

subject to provision of conditions encouraging the learner-centered teaching effectiveness in the development of the students' creative activity.

The process of vocational and educational training of the future music teachers should be arranged so that it is activated the mechanism of personal development. It is possible subject to a set of conditions. In this regard, it is advisable to distinguish between two groups of conditions, the fulfillment of which in the course of the vocational teacher training of students will provide a positive dynamics of the level of their professional and creative activity.

The first group includes the subjective conditions related to individual psychological characteristics of future music teachers. The condition for successful formation of professional and creative activity of students is the presence of a student's positive motivation. The motivation means various motives inducing the activity of the individual. The content of the motivation also includes the professional values, ideals, beliefs, orientation, needs, interests, desires and so on. These tools promote the active actions and behavior of the students in the educational process.

An equally important feature of the learning environment is to design various modalities of action according to the demand vector and their professional competence. Matching the nature of activity with the students' needs leads to the fact that this activity generates its internal motivation to participate therein, thus stimulating the activity of the individual.

In the course of activity the students gain the experience of vocational and creative activity, during which the participants can not only be a passive spectator of what is happening but act as active participants and organizers.

The students' activity is enhanced significantly if the goals of their activity become personally meaningful to them, gradually become more complex, acquire the creative nature, and the learning methods and techniques satisfy their need for novelty and innovative approach to solving the educational problems.

In terms of education, pedagogically organized and professionally oriented environment, the students are always the subject of activity, its active participants and organizers, and this fact stimulates their personal growth. This process takes place in stages. In the first stage, the future teacher learns the academic work methods and professional activity standards. This results in the formation of a student as the subject of professional activity or a personality, and its professional status. The second stage is the formation of the needs in a professional activity, i.e. development of professional characteristics of the future music teacher. The third stage forms the need for creativity and innovative solution of professional problems. To put in other words, all of these stages provide for development of their creative activity as an important component of the professional and personal experience.

Sample of Research

The experimental work covered 80 full-time students. Its purpose was to identify the source of the students' creative activity, and the opportunities for musical and aesthetic education in the development and consolidation of this professionalism indicator in the future experts. The basis of the stating stage was the paper on diagnosing the identification of various indicators serving as the characteristics of structural components of the creative activity.

Instrument and Procedures

The basis of experimental work was formed by the following criteria: motivation (the parameters of which are the interest in the musical and aesthetic education, striving to penetrate into the essence of the studied musical-aesthetic phenomena and processes, and the need for novel emotional perceptions and feelings); cognitive-operational (the parameters of which are the musical-aesthetic competence, the ability to compare and analyze the musical works, the knowledge of music school repertoire, theoretical understanding of music works performed and listened to; awareness of the importance of music works in the professional development of students, the ability to navigate the musical repertoire, the ability to organize and host the music events, the ability to allocate the means of expression in a music work); formation of musical abilities (the parameters of which are the musical creativity, interpretation of music, creative imagination, improvisation in creating the musical pieces, original solving of music pedagogical problems); emotional and volitional (the parameters of which are the emotional perception of musical works, proactive finding a solution to educational problems, autonomy in the creation of

music and improvisation, emotional response to musical works); and evaluation criteria (the parameters of which are the objectivity, integrity, and practicality of the studied material).

During the stating phase of the experimental work the expression of student's interest to the academic subjects of music and pedagogical orientation was studied using the scale.

The basis of the experimental work at the formation stage was formed by the creative tasks, united by the idea of complex integrating of the subjects of musical and pedagogical training in such directions as musical and aesthetic education; active musical and educational activities and instruction to the work from the ability to play music to improvisation and creation of a wide range of musical images. The experimental work was based on the principles of forming a holistic vision of the subject studied, its role in the professional development of a future music teacher; didactic validity of a musical work for the student's individual curriculum; incorporation of music, instrumental, and educational plan for each student with a clear definition of the role perspectives of its development, clear understanding of the educational potential of the musical repertoire and pedagogical appropriateness of its use in work with students, as well as understanding the psychological mechanisms of musical and educational activities.

A variety of types of the music and teaching activities (performance of musical works, free reading from the sheet, music piece transposition, harmonization of melodies, analysis of musical works, their genre and textural variation, improvisation and author's creativity on a proposed or random subject) determined the expression and emotion, independence and originality, development of special skills, which stimulated a shift of the creative activity from a low to a higher level of expression.

The effectiveness of developing the creative activity is directly dependent on the tier organization of the musical and educational activities of students, the focus of their interest and attitudes to work as a music teacher, a complex combination of reproductive, reflective and creative nature of the musical and educational activities, the use of objective criteria for assessing the degree of detecting the students' creative activity. The correctness of the chosen areas in forming experiment and effectiveness of the program of the content-procedural side of the music teacher training was confirmed experimentally and provided a positive growth in the level of students' creative activity.

Data Analysis

The results obtained during diagnostics confirmed the assumption that an important factor in the system of musical and pedagogical training is motivation, emotional and aesthetic focus of interests, and the students' understanding of the importance of enriching their professional and personal experience is essential. The further experimental work was aimed at promoting and consolidating the interest of students to music and educational activities, the development of sustained motivation, the need for creative solution of educational problems, development of creative abilities, emotional and volitional personality traits, without which the creative activity will not be identified.

The creative manifestations of students acquire the focused, active and emotional character if the following requirements are followed during the classes:

- select the additional musical material that serves as a model of creative action and stimulates the formation of creative skills;
- use the teaching tools and methods reinforcing the creative atmosphere of the class, activity, cognitive interest of and improvisation its participants;
- complicate the creative tasks from class to class, thus providing the dynamics of the students' activity from reproductive to creative levels;
- ensure the internal interaction of the objective and methods of musical and educational activities.

The creative condition of the student and the whole student's group shall be maintained continuously and request that the creative search became a collective desire in terms of the "teacher - students" relations. The task of the teacher is to develop gradually the autonomy of students in independent judgments, objective evaluation of different points of view, encouraging the initiative, improvisation and creative imagination.

Engaging students in the purposeful, systematic, organized activities, musical and pedagogical orientation that combines the perception, performance, creation, is essential for the

development of their creative activity. Setting for the creativity in different types of music and educational activities is an important incentive for students' activity.

Results of Research.

The conducted experimental work has shown the dynamic growth of the creative activity of students from low to higher level of its detection. The purposeful and systematic musical and pedagogical training, subject to following the identified and experimentally verified set of instructional conditions of its organization provided for manageability and efficiency of the process of forming the creative activity of the future music teachers. The high level of creative activity is determined by positive motivation, strong interest and focus on music and teaching activities, expression of emotion and significant willpower, self-reliance, initiative, imagination, the ability to perform the non-standard learning tasks, as well as the availability of adequate self-assessment of one's own musical abilities and professional activities.

The organic nature of the relationship between realization of the professional and personal meaning as well as the emotional state and mood of students is the leading feature of the educational environment as a motive of creative activity of the future teachers. The educational environment should include all features that would mobilize the internal efforts and abilities of students for professional self-development, self-expression and self-assertion. This can be achieved in the event that the educational process becomes a part of the social and cultural environment in which the students work.

Important is the use of means and conditions that ensure the student's conversion from an object to the subject of learning activities, democratization and humanization of relations in the "teacher - students" relations, modernization of musical and pedagogical training, the aims of which should be the student's personality and its creative activity as an indicator of the teacher's professionalism. It is intended to provide a set of conditions for self-actualization of opportunities and abilities of each student and to add the personality-oriented nature to training. An integrated approach to the development of creative activity of the students is an integrated system of interdependent dialectical scientific and pedagogical principles, methods and tools for training their activity. The complexity in the development of creative potential of the future specialist serves as a way to optimize the whole teaching, research and training process as the basis for forming a fully developed personality.

Formation of the creative activity of the future specialist necessitates the organic unity of formation, training and education, integration, training, research and educational work within a holistic educational process.

Discussion.

Creative activity, in our view, is a complex fusion of emotional, volitional and intellectual qualities and processes. The external manifestation of activity is characterized by initiative, autonomy, emotionality, volitional, deliberate actions, awareness of human behavior and actions. The inner foundation of the creative activity is a bright individuality of the future professional that gives rise to the personal attitude to reality. The creative activity is expressed only in a specific, purposeful, creative activity, and the creative activity is always related to the search for the new ways of learning, is characterized by elements of novelty, originality, unconventional positive attitude of the future specialist to the process of musical and educational activities.

The content of creative activity as a complex personality formation is formed by all aspects of the individual's inner world, i.e. intellectual, emotional, volitional skills, habits, abilities. Therefore, the content of creative activity, in our view, is a multi-faceted structure combining the following components, i.e. motivation, cognitive-operational, emotional and volitional complex of creative abilities, as well as an evaluative component. All these components are interrelated and interdependent.

Conclusion.

Thus, the creative activity of the teacher of music is a complex personal education combining in its content the desire and willingness for internal beliefs to perform the professional proactive, innovative, independent actions in solving the tasks of musical, educational, productive activities, expressed in the ability to deviate from the template, associative thinking, emotional perception of

music and educational reality, the need for a sustained improvisation and creativity. The creative activity is expressed as a dialectical unity and combination of initiative with responsibility, diligence, self-organization, and clarity of activity, independence with discipline, productive aspects of activity with reproductive activity, creative work with standards and traditions. The degree of activity of the future specialists largely depends on the ability of implementation of communication between professional knowledge and positive-emotional attitudes as a result of formation of the personal meaning of the music teacher education in the educational environment.

The organization of students' independent activity becomes important as one of the conditions stimulating the growth of their creative activity. Involving students in the independent creative activity combining the motivation, content-operational, emotional and volitional, as well as evaluative components in its structure has a positive impact on the creative activity of students. The motivational component involves the formation of the need for formulating and solving the musical and educational activities. The content-operational components involves the development of the ability of the future music teacher to perceive the music work as a form of art, to analyze and objectively evaluate its role in shaping the creative person, to realize the need for specific knowledge of the theory and history of music in a non-musical and pedagogical issues; to master the skill of comparing the artistic means of music, to accumulate the music and aesthetic experience, which is the foundation for future creative activity of music teachers in music and pedagogical process. In emotional and volitional component of the activity the emotional stability, emotional feelings, volitional efforts, dedication, perseverance, and initiative are manifested. The evaluative component provides for practical realization of musical and educational activities, improvisation, creative approach to solving problems, comparison of the predicted and achieved results and their evaluation. Involving students in purposeful, systematic, organized activities, musical and pedagogical orientation combining the perception, performance, and creation, is essential for the development of their creative activity.

This study is not exhaustive in the problem development. The issues of developing the training programs in music and pedagogical subjects of personal orientation, determination of forms and methods of the off-class work stimulating the creativity for the future music teachers and enriching their professional and personal experience need further investigation.

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УДК 378:371.134+78

Роль творческой активности в формировании профессионально-личностного опыта будущего учителя музыки

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Аннотация. В статье исследована и обоснована роль творческой активности в формировании профессионально-личностного опыта будущего учителя музыки. Определено, что творческая активность, как сложное личностное качество, выступает условием и результатом музыкально-педагогической деятельности, который обеспечивает нестандартный подход и творческое решение профессиональных задач. Доказано, что высокий уровень творческой активности характеризуется положительной мотивацией, устойчивым интересом к музыкально-педагогической деятельности, глубокой эмоциональностью и значительными волевыми усилиями, самостоятельностью, инициативностью, яркой фантазией, способностью к нестандартному выполнению заданий, наличием адекватной самооценки собственных музыкальных способностей и профессиональных действий.

Ключевые слова: творческая активность; профессионально-личностный опыт; будущий учитель музыки; профессиональная подготовка.