

Academic Journal of Research and Scientific Publishing

International peer-reviewed scientific journal

The Thirtieth Issue

Publication date: 05-10-2021

ISSN: 2706-6495

doi.org/10.52132/Ajrsp.e.2021.30

Email: editor@ajrsp.com

Dedication

It is our pleasure and great privilege to present the thirtieth issue of the Academic Journal of Research and Scientific Publishing to all researchers and doctors who published their research in the issue, and we thank and appreciate to all contributors and supporters of the academic journal and those involved in the production of this scientific knowledge edifice.

Academic Journal of Research and Scientific Publishing

Editorial Board

Chief Editor:

Prof. Dr. Khetam Ahmed Al-Najdi

Advisory Members:

Dr. Aicha abdelhamid eltteli abdelhamid

Prof. Dr. Riad Said Ali Al-Mutairi

Editorial Members:

Dr. Azab Alaziz Alhashemi

Prof. Dr. Saleh Bashir Bin Sulaiman Bouchelaghem

Prof. Dr. Khaled Ibrahim Khalil Hijazi Abu Alqumsan

Dr. Abu Obida Taha Gebreel Ali

Dr. Badreddine Berahlia,

Dr. Zainab Ridha Hammoodi Aljwaid,

Dr. Basma Mortada Mohamed Foda

Dr. Wisal Ali Al-hommada

Dr. Bilal Khalaf Ali Alzboun

Dr. Tameem Mosa Alkrad,

Dr. Walaa Al-Kurdi

Prof. Dr. Khaled Mohamed Abdel-Fattah Abu Shaira

Dr. Badir Mohamed

Dr. Abdulameer Abbas Al-khamees Ali

Dr. Nawal Hussein Siddig

Table of Content:

No	Paper title	Author Name	Country	Field	Page No
1	Water Framework Directive (an “open up” tool for Public participation in water policy)	Dr. Polytimi M. Farmaki	Greece	Law	6-20
2	Surgically Assisted Rapid palatal expansion and Mini-screw Assisted Rapid Palatal Expansion - A Review	Dr. Vijay Kumar Vaghela	India	Dentist	21-29
3	COVID-19 in Jeddah Islamic Port (Ministry of Health, Kingdom of Saudi Arabia)	Nashwan M. Abdullah, Abdullah J. Alsahafi, Ahmed A. Osman, Mohammed S. Alharbi, Essa A. Aljehany, Adel S. Alghamdi, Tarek A. Alzahrani, Majed M. Alqarni, Hassan O. Qahwaji, Ruwaida A. Aljazzar	Saudi Arabia	Public Health	30-47
4	High Gain Microstrip Active Antenna Utilizes as Transmitter and Receiver with Linear and Circular Polarization	Engr. AHMED. S. ALZAHIRANI, Prof. ADNAN. M. AFFANDI	Saudi Arabia	Electrical and Computer Engineering	48-62
5	The Training Skills of Military Officers in Treating Al-Istiqlal University Students from the Viewpoint of the Students Themselves	Dr. Amer Saber Shehadeh, Dr. Mohammad Taleb Dabous, Dr. Nader Taleb Shwamreh	Palestine	Education	63-95

6	Estimation of Some Physico-Chemical Parameters of Tannery Effluents to Surrounding Environment (A Yemeni Case Study)	Adel A. M. Saeed, Nasser M. N. Masood, and Ali N. A. Al-Kumi	Yemen	Science	96-110
7	Afghan Undergraduate Students' Perceptions Towards Effective Teaching	Faridullah Farid Mirza Khan Nikzoy Wali Khan Monib	Afghanistan	Languages and Literature	111-123

Water Framework Directive (An “Open up” Tool for Public Participation in Water Policy)

Dr. Polytimi M. Farmaki

Legal Advisor ANKO SA, PhD, Department of Accounting and Finance, Western Macedonia
University of Applied Sciences, Kozani, Greece

Email: pmfarmaki@gmail.com

Abstract:

The new EU Water Framework Directive (WFD) 2000/60 prescribes an adaptive water governance system and has been the European Union's most comprehensive tool for the management and protection of water resources. This article analyses how WFD encourages the active involvement of “all interested parties” and represents how public participation has a key role in successful implementation. The aim of this paper is to understand the functioning and effectiveness of the new model introduced to address the lack of implementation of EU environmental rules, as WFD since its introduction in 2000, requires member states to design and implement river basin management plans via participatory processes. Moreover, we have identified that Common Implementation Strategy of WFD was designed as a tool for public participation and stakeholder involvement to river basin management planning and how participatory approaches are implemented as the new "governance" within the EU in the field of environmental policy.

Keyword: Water Framework Directive; integrated water resources management; river basin planning; public participation; water governance;

1. Introduction

The most important factor influencing water management and protection policy over the two last decades, has been the change that has taken place within the EU with the adoption of European new governance forms in the context of EU environmental policy. The decision to drastically reform water policy was not taken suddenly and unjustifiably but was a response to political, economic and social developments at European level, and the result of pressure from many different parameters such as (Kallis, G. and Nijkamp, P. 2000):

- Reports concerning deteriorating water status quality in Europe. Two years after the implementation of WFD the key facts of water situation in Europe are: a) 20% of all surface waters in the EU is threatened by pollution and river water quality does not improve overall, with the exception of some rivers with serious pollution problems b) Groundwater provides 65% of all drinking water in Europe, with high concentrations of nitrogenous substances, insecticides, hydrocarbons and heavy metals c) 60% of European cities are overexploiting their groundwater resources and 50% of wetlands are at risk due to overexploitation of groundwater resources. Obviously, total water pumping has decreased significantly since 1980, mainly due to the removal of heavy industry and reorientation d) the area of land irrigated has highly risen (European Commission, 2002)
- The high cost of implementing the data and standards set by the directives by the Member States
- Reactions against the EU centralized approach in relation to economic data and the non-adaptability to the local conditions characterizing each Member State
- The gaps and contradictions between the provisions in many and different directives
- The finding that water resources quality and quantity are both two characteristics that could not be addressed separately

2. Public Participation in WFD: Theoretical Background

One of the more discussed and analyzed topics of WFD is public participation and stakeholder involvement. The WFD 2000/60/EC refers in its article 14 «Public information and consultation» that:

“...1. Member States shall encourage the active involvement of all interested parties in the implementation of this Directive, in particular in the production, review and updating of the river

basin management plans. Member States shall ensure that, for each river basin district, they publish and make available for comments to the public, including users:”

Article 14 calls on the Member States to encourage the active involvement of all stakeholders in the individual stages of implementation of the Directive, as well as in the establishment of river basin management programs. "Public participation" is not only provided for in Article 14 of the Directive, but also in individual provisions in the Preamble, in other Articles and in the Annexes.

The following guidelines are set out in the Preamble to the Directive, points 14 and 46: 14. *«...The success of this Directive relies on close cooperation and coherent action at Community, Member State and local level as well as on information, consultation and involvement of the public, including users...»* 46 *«To ensure the participation of the general public including users of water in the establishment and updating of river basin management plans, it is necessary to provide proper information of planned measures and to report on progress with their implementation with a view to the involvement of the general public before final decisions on the necessary measures are adopted...»*

Finally, Annex VII sets out the content of river basin management plans as follows: *«...A. River basin management plans shall cover the following elements:*

.....
9. a summary of the public information and consultation measures taken, their results and the changes to the plan made as a consequence;

.....11. the contact points and procedures for obtaining the background documentation and information referred to in Article 14(1), and in particular details of the control measures adopted in accordance with Article 11(3)(g) and 11(3)(i) and of the actual monitoring data gathered in accordance with Article 8 and Annex V...».

The question, however, is what is the meaning and definition of terms "participation" and "public" and to which groups of people does it refer, because Article 2 of the Directive, although it contains a multitude of definitions, does not define the specific concepts.

However, after the adoption of Directive 2000/60, several texts have been drafted by the Commission Water Directorate and the environmental organization WWF, which have provided

guidelines on how to implement the provision of Article 14 and the implementation of public participation.

These documents, in conjunction with the common implementation strategy of the directive, which was drawn up jointly by the Member States with Norway and the Commission, contain a number of elements for defining the concept of "public participation".

Participation" is a concept that is interpreted in many different ways under the Directive, but it is generally accepted that the process by which anyone with a direct interest in a decision is ensured is involved in the adoption of that decision. The types and manner of "involvement" of stakeholders varies depending on how passive or active their role is in the decision-making process. The following table is a categorization of the types of participation and their characteristics (Harrison, A., Schmidt, G., Avis, C., Hauser, R. 2001):

Table 1: Types of Participation

<i>PARTICIPATION TYPE</i>	<i>CHARACTERISTICS</i>
INFORMATION	People get involved through information about what has already been decided or has already happened.
CONSULTATION	People participate through consultation or with questions asked
IMPLEMENTATION	People participate to achieve the goals set by those who started the process
CO-DECISION	People are involved together in the analysis of events and the development of action plans
INDIVIDUAL DECISION	People participate by taking independent initiatives to change plans and policies

Public (or "general public") definition is given in SEIA Directive (2001/42/EC) and Aarhus convention art. 2(4)) as "One or more natural or legal persons, and, in accordance with national legislation or practice, their associations, organizations or groups" Interested party (or "stakeholder") is considered as any person,

Group or organization with an interest or "stake" in an issue, either because they will be directly affected or because they may have some influence on its outcome. "Interested party" also includes

members of the public who are not yet aware that they will be affected (in practice most individual citizens and many small NGOs and companies).

There is a wealth of definitions in the literature about public participation as it is a multi-dimensional concept which refers to: (1) who participates, participation of interest group representatives, stakeholders and the public; (2) how participants exchange information, from simple one-way provision of information, to intensive dialogue and deliberation in public meetings; and (3) power to influence the final decision and policy implemented (Fung). Participation is defined as the involvement of non-state actors in collective decision-making processes and in social sciences it is closely connected to public involvement. The involvement means that participation of the public starts from the agenda setting stage and goes all along till the final implementation stage (Newig, J., Pahl-Wostl, C., & Sigel, K. 2005).

Bibliographic findings of studies conducted present particular interest in the context of Directive 2000/60 on water resources management are the various forms of public participation (information, consultation, discussion, co-designing, co-decision making, decision making). In his study Johnsson (2005) by investigating public participation in Sweden, through committees comprised of groups and stakeholders came to the conclusion that if something affected the environment people were more likely to react. More interesting was Mostert et al. (2007) study which based on the case studies of 10 EU countries arrived to the conclusion that the role of stakeholders was limited as countries didn't want to move from the traditional governance style of policy and implementation to a participatory process. But even in countries with a corporatism tradition such as Sweden, the results of the study of Jager, N., et al (2016) showed that public participation in WFD was limited. In another study Ozerol and Newing (2008) tried to develop criteria in order to evaluate the results of public participation in water resources management. Their main finding was that public participation should be carried out by local authorities as there were deficits in communication, information, knowledge, involvement and financing of stakeholders. All these studies were based on the new modes of environmental governance.

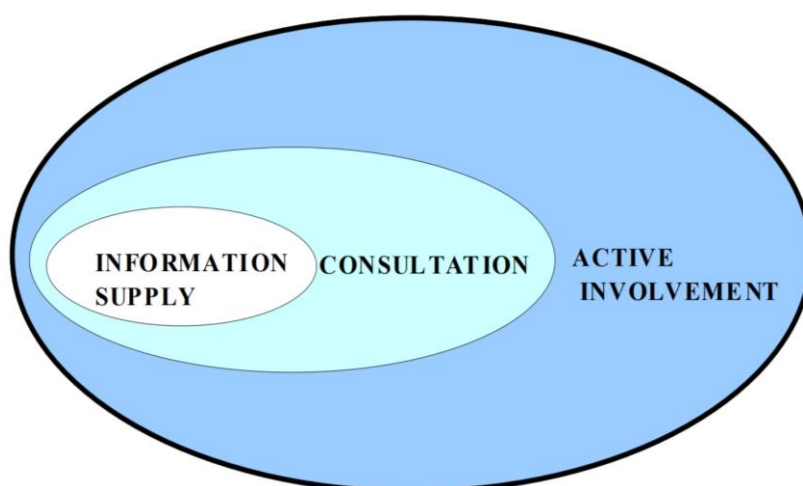
A study of the individual provisions (article 14 and Annex VII) makes it clear that the Framework Directive includes three forms of "public participation" (Barreira, A. and Kallis, G. 2003):

- Active participation in all dimensions of the directive implementation and especially in the design process. Active participation means,

on the basis of the terms and conditions of the Directive: (a) participation in the designation and analysis of the catchment area through the identification of basins (Article 3), the analysis by economic and man-made factors (Article 5), the definition of protected areas; (Article 6), (b) participation in the assessment of the status of river basins, in relation to the requirements and data set by the Directive; (c) design and implementation of the program of measures; and (d) implementation of river basin plans in the case of international basin coordination of stakeholders.

- Consultation enabling the acquisition of knowledge from the comments, experiences and views of the stakeholders. Public consultation is essential for the adoption of river basin management plans. The consultation process is carried out through the obligation of the Member States to make available to the public a timetable and work program, on the management plan of each basin and on the exchange of views and positions between those involved through an oral procedure and written comments.
- Access to information that formed the basis for decision making. Access to information means adequate provision of information at all stages of the implementation of the Directive and access at the request of the public to documents and information used by States to formulate the river basin management plan.

Table 2: Public Participation



Source: Water Directors, Guidance on public participation in relation to the Water Framework Directive, Active involvement, Consultation, and Public access to information, Final Draft 1.3 (24/10/2002), endorsed during the informal meeting under the Danish Presidency in Copenhagen.

Among those three forms of participation, two information supply and consultation should be provided by the Member States, while the third active involvement should be encouraged. Furthermore, based on the obligations arising from this article, Member States should consult the public and water users on: a) the timetable and action plan for the preparation of management plans, b) the review of important issues and c) the draft management plans (Andreadakis, A. 2002).

Consultation is Lowest level of public participation if we consider information supply as being the foundation. The government makes documents available for written comments, organizes a public hearing or actively seeks the comments and opinions of the public through for instance surveys and interviews. "Consultation" in art. 14 of the Directive refers to written consultations only. Preamble 14 and 46 and Annex VII refer to consultation in general. On the other hand active involvement is a higher level of participation than consultation.

Active involvement implies that stakeholders are invited to contribute actively to the planning process by discussing issues and contributing to their solution.

The information-updating and the consultation with the public will take place after the creation of a preliminary plan for the management of the river basin, but the interested parties will have direct access to the supporting documents and information, which were used for the elaboration of the plan. This point of the directive has been heavily criticized, because, while emphasizing the need for transparency and participation at the critical stage of the proposed policy-making process, participation will be belated and highly limited.

Within the EU, significant efforts have been made so as to establish a legal framework on the right of citizens to get informed about environmental issues. The aim of the Community was the involvement of citizens and the achievement of "shared responsibility", as a means of active "public" participation in the processes of production and implementation of environmental policy. The Directive 90/313 has been the first step in this effort.

The revision of Directive 90/313/EC was another measure to address implementation problems.

The particular directive provided that the public could have access to environmental information in order to be informed about the environmental impact of industrial activities and government decisions. The Directive also required Member States to publish information on the general state of the environment. However, the substantial experience gained from the implementation of this Directive mainly concerned access difficulties, which were as follows:

- the identification of the information that could be disclosed and the competent authorities for the provision of this information
- the exceptions to the obligation to access information and the obligation to state reasons for refusal
- the time limits and related charges for providing the information

At the end of 1999, the Commission's Directorate-General for the Environment presented a working document on the revision of the dual-purpose directive, addressing all the above-mentioned difficulties and aligning Community legislation with the provisions of the Aarhus Convention.

Proper and complete information of the citizens and their access to as much information as possible is a key element for the effectiveness of government policies. Equally important is public access to public documents (Lymouris, N.P. 2001),

in order to avoid mistakes and abuse of power by civil servants and institutions in general. On 26 January 2000, the Commission adopted a proposal for a Council and European Parliament regulation on public access to European Parliament, Council and Commission documents. This proposal aims to implement Article 255 of the EC Treaty, which recognizes European citizens and residents of the Union the right of access to European Parliament, Council and Commission documents. Regulation 1049/2001, L145 / 43 of 31 May 2001. Access to information and updating are the key tools for strengthening citizens' rights and their access to the process of production and implementation of environmental law.

Providing information to citizens is the basis for achieving their involvement in environmental issues and the success of the institutions' initiatives in the field of environmental policy. It is necessary for the citizens to know exactly what, for what reason and by whom each initiative is going to be taken, since only with clear answers to these questions might the interest of the "public" for the environment be refined.

Obviously, the provision of information to citizens by local authorities requires some financial costs, which, however, is minimal compared to the costs required in the event of a reaction of the "public" to the implementation of an initiative (Filho, W.L. 1999).

OECD in a survey conducted on the possibility of citizen involvement in the legal process gave a definition for informing citizens. According to this definition, information is a one-way relationship in which governments produce and deliver information to citizens. The information covers both "passive" access to information at the request of stakeholders and "active" measures by the government to provide information to citizens (OECD 2001) .

In the field of water resources, informing the public and providing information to citizens by specialized scientists could significantly contribute to the awareness of the value of water and the problems that exist due to over-consumption and pollution. According to research conducted at the Institute of Geology and Paleontology at Darmstadt University of Technology, one of the main reasons for the increase in environmental pollution and misuse of water resources is the lack of interest and education of citizens on environmental issues. According to the professor who conducted the research, environmental education should not be aimed only at specific population groups such as pupils or students, nor exclusively in industrialized countries, but should cover the entire population, worldwide. In addition to ordinary citizens, a specific goal of environmental education should be the continuous training and education of specialists and engineers involved in water resources management.

The conclusions of the research advocated as a solution to address environmental problems related to water, the cooperation of special scientists and institutions and the awakening and education of citizens with the aim of their participation in the design and implementation of various policies in the field of water. The results of this research were presented during the International Symposium, organized by the European Thematic Network of Education and Training in collaboration with the International Hydrological Program of UNESCO, entitled: "The learning society and the water- environment" (Bundschuh, J. 2000).

3. Common Implementation Strategy as a tool for public participation

After the adoption of WFD, Norway and the European Commission formulated a Strategy for the Joint Implementation of the Directive under the Swedish Presidency (Common Implementation Strategy).

The reasons, which led the Member States to create a common strategy for implementing Directive 2000/60 / EC according to the Strategic document: “Common Strategy on the Implementation of the Water Framework Directive” were:

- The long and demanding timetable for the implementation of the individual provisions of the Directive
- The complexity of the individual provisions
- The diversity of possible solutions to technical, scientific and practical problems
- The large number of substantive arrangements contained in the annexes
- Strict limitation of human resources and financial resources available for the directive implementation

The adoption of the Joint Implementation Strategy was preceded by an informal meeting of EU Water Directors with the Norwegian Water Directorate, held under the French Presidency of the Council, in Paris on 23-24 October 2000, setting out the guidelines and identifying the key elements for implementing the :

- The exchange of information between Member States and the European Commission
- The participation and information of the "public" on the key points of the directive and the implementation process
- Achieving coherence between the implementation of the Other Sectoral Policies Directive and the other Water Directives
- The active involvement of stakeholders, NGOs and civil society in the implementation of the directive
- The establishment of working groups and the implementation of formal guidance documents for implementation
- The establishment of infrastructure structures in the Member States for the effective implementation of the Directive
- The design of integrated river basin management plans
- The development of cooperation with the candidate countries and the study of the possibility of their involvement in the implementation of the Directive (in particular for the management of the international transboundary river basins of the Community)

The Common Implementation Strategy document identified many advantages of Public Participation in water policy making, such as public awareness, use of knowledge of different

stakeholders, reduction of delays in implementation and effective interaction between public government and experts. The provision for the active participation of the "public", NGOs and civil society was, after all, the key tool for achieving all the long-term and intermediate objectives in the implementation process of the Directive and was in line with the provision of the 5th Environment Action Program. For division of responsibilities, *“shared responsibility”*, at different levels of government (European, national, regional and local).

However, although the strategic document for the implementation of Directive 2000/60 / EC provided for the participation of all stakeholders, this participation would take the form of informal meetings and consultations and it left considerable room for interpretation and produced non-legally binding documents (Brouwer 2013). Public participation was one of the main challenges in WFD, but what is the real meaning of this participation in the Water Framework Directive and how it reflects the shift «from government to governance»? What difficulties are found in the transition from the legal framework to the practical implementation of the Water resources management in the River Basin District 09 in Western Macedonia, Greece? This study aims to answer the above questions by investigating the theoretical background of public participation in the WFD and by analyzing the level of public participation in River basin management plan in the River Basin District 09 in Western Macedonia, Greece. Finally, some conclusions are posed in order to make policy recommendations.

The main objective of this new strategy was to address the weaknesses of the "command and control" regulatory model in the implementation of Community environmental law,

through the involvement of "stakeholders" in shaping the implementation process of Community directives. Nevertheless, the involvement of the "public" is perhaps the most appropriate way to address the implementation gap.

The principles on which the Strategy for the Implementation of the Directive is based are the principles of transparency, partnership and "shared responsibility". These principles, combined with the key elements that characterize the way the directive is implemented, compose the concept of the new form of European governance in the context of EU environmental policy for greater flexibility in the means of implementing EU policies, as provided for in the White Paper on Commission Governance.

4. Discussion

The diffusion of decision-making responsibilities at different levels and the strengthening of decentralization and local government are the main issues analyzed in the present study (Hooghe L. Marks G. 2001). This “new” form of organization of the administrative mechanism of the modern western state is expressed in the *multilevel governance* developed within the EU, in order to describe the complex interactions between all actors (EU institutions, governments, regional and local government bodies, NGOs, business interests, organizations) involved in EU procedures (DeBardeleben J. and Hurrelmann 2007) .

Scholars support two views on the role of the EU unification process. in shaping multilevel governance. A. Moravcsik supported among others, that the unification process strengthened the role of the state at the expense of local and decentralized administration and the participation of states in the EU led to an over-concentration of power in the administrative and governmental elites and the diffusion of power to a limited number of levels (Type I of multi-level governance). The opposite view holds that the EU imposed on the nation-states its own structure of multilevel governance, strengthened the role of local government and organized interests, by diffusing responsibilities at various levels (Type II multilevel governance).[5]

The key features of the new "governance" within the EU in the field of environmental policy (COM (92) 23 final) and in particular, the management of water resources, as set out in Framework Directive 2000/60 are (Baker Susan, 2001, Kooiman J. 1993, Baker Susan 1997, Hix Simon 1998, Cini Michelle 2000):

- The integration and implementation of the principles of "cooperation" and "shared responsibility" in the formulation and application of Community environmental law
- Participation in the exercise of governance - outside the EU - social, political, and administrative factors and the downsizing of power, that is, the move of EU power - in some areas - to regional and local institutions and NGOs for a healthy European governance requires the cooperation of European, national, regional and local governments. These four stages are, each one separately, necessary and their presence is required throughout the decision-making process
- The non-hierarchical involvement of governmental and non-governmental actors (NGOs, economic operators, services) in both the production process and the application of Community law.

➔ The use of new environmental policy tools, such as fiscal incentives, horizontal aids (information, research, and education), financial support mechanisms and voluntary agreements (EMAS, Eco-label, and ISO, aiming at rewarding environmental performance.)

➔ The integration of environmental policy into other sectoral policies. This means that environmental concerns should be included in other policies and that other General Directorates of the Commission should take their environmental impact into account when designing their programs and actions.

➔ The efficient operation of institutions, bodies, and the transparency of their work with the simultaneous access of the citizen.

5. Conclusion

After the implementation of WFD in the water sector, there has been a significant increase in the stakeholders involved in management and an increase in the role of both governmental and non-governmental actors. In addition, new management bodies were set up and the private sector invaded as a new factor in water management and supply. At the same time in the field of decision-making and establishment of water management law, significant changes took place with the integration of the principles of "cooperation" and "joint responsibility" and the non-hierarchical involvement of different levels and decision-making centers.

This paper shows that WFD is an important instrument for the participation of interested parties and the public, whereas the competent authority has only the responsibility to implement the management plan. The new water policy implemented through the WFD created a new system of bodies at local, national, European and international level that collectively made decisions and exercised the management of water resources (Kaika, M. 2003).

6. References

1. Andreadakis, A. (2002). The importance of coordinated action for the implementation of the Water Framework Directive 2000/60" Technical Chamber of Greece, 2206, 39-111
2. Baker Susan (1997). The evolution of European Union environmental policy, From growth to sustainable development, 101
3. Baker Susan (2001). Environmental governance in the EU in Thomson Grahame (ed.) Governing the European Economy, London, Sage, 205

4. Barreira, A. and Kallis, G. (2003). The EU Water Framework Directive and public participation in transboundary river basin management in Timmerman J. Langaas S (eds) Environmental Information in European Transboundary Water Management, IWA publishing, 92-107
5. Bundschuch, J. (2000). The sustainability principle in water resources management requires education and training as missing link between problems and solutions in Van der Beken, A., Mihailescu, M., Hubert, P. and Bogardi, J. The learning society and the water- environment, Official Publications of the European Communities, Belgium, 79-85
6. Cini Michelle (2000). Administrative Culture in the European Commission: The Cases of Competition and Environment” in Nugent Neil (ed.) At the heart of the Union, Studies of the European Commission, Second Edition, Macmillan Press Ltd, 81- 82
7. COM (92) 23 final Volume II Towards Sustainability: A European Community Programme of Policy and Action in relation to the Environment and Sustainable Development
8. DeBardeleben J. and Hurrelmann (2007). Democratic Dilemmas of Multilevel Governance Legitimacy, Representation and Accountability in the European Union, Palgrave Macmillan, 2-5
9. Directive 90/313/EEC EE L 158/56 of 23rd /06/90
10. European Commission, (2002). The Water Framework Directive. Tap into it! Office for Public Publications of the European Communities, Luxembourg, 2
11. Filho, W.L. (1999). Getting people involved” at Buckingham-Hatfield, S. and Percy, S. (eds) Constructing Local Environmental Agendas. People, places and participation, Routledge, London and New York, 36
12. Harrison, A., Schmidt, G., Avis, C., Hauser, R. (2001). WWF’s preliminary comments on Public Participation in the context of the Water Framework Directive and Integrated River Basin Management
13. Hix Simon (1998). The study of the European Union II: the ‘new governance’ agenda and its rival, Journal of European Public Policy, 5, 38- 65
14. Hooghe L. Marks G. (2001). Types of Multi-Level Governance, European Integration online Papers (EIoP), 5 (11)
15. Jager, N., Challies, E., Kochskamper, E., Newig, J., Benson, D., Blackstock, K., Collins, K., Ernst, A., Evers, M., Feichtinger, J., Fritsch, O., Gooch, G., Grund, W., Hedelin, B., Hernández-Mora, N., Hüesker, F., Huitema, D., Irvine, K., Klinke, A., ... von Korff, Y. (2016).

Transforming European Water Governance? EU Water Framework Directive implementation in 13 member states. *Water*, 8(4), 156. <https://doi.org/10.3390/w8040156>

16. Jonsson A. (2005). Public participation in water resources management: stakeholder voices on degree, scale, potential, and methods in future water management. *Ambio*. 34(7) 495-500..
17. Kaika, M. (2003). The Water Framework Directive: a new directive for a changing social, political and economic European framework, *European Planning Studies*, 11(3), 303-320
18. Kallis, G. and Nijkamp, P. (2000). Evolution of EU Water Policy: a critical assessment and hopeful perspective. *Journal of Environmental Law and Policy*, 3, 301-335
19. Kooiman J. (1993). Governance and governability: using complexity, dynamics and diversity in Kooiman J. (ed.) *Modern Governance: New Government- Society Interactions*, London, Sage, 2
20. Lymouris, N.P. (2001). Citizens' access to Community documents and the new regulation 1049/2001, Department of International, European and Area Studies, Panteion University
21. Mostert, E., Pahl-Wostl, C., Rees, Y., Searle, B., Tàbara, D., & Tippet, J. (2007). Social learning in European river-basin management: barriers and fostering mechanisms from 10 river basins. *Ecology and society*, 12(1), 19
22. Newig, J., Pahl-Wostl, C., & Sigel, K. (2005). The Role of Public Participation in Managing Uncertainty in the Implementation of the Water Framework Directive. *European Environment*, 15(6), 333-343.
23. OECD (2001) *Engaging Citizens in Policy-making: Information, Consultation and Public Participation*, Puma Policy Brief No 10. p. 2
24. Ozerol, Gül & Newig, Jens. (2008). Evaluating the Success of Public Participation in Water Resources Management – Five Key Constituents. *Water Policy*. 10. 639-655. 10.2166/wp.2008.001.
25. Strategic document: “Common Strategy on the Implementation of the Water Framework Directive”

Copyright © 2021 Dr. Polytimi M. Farmaki, AJRSP. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY NC)

Doi: doi.org/10.52132/Ajrsp.e.2021.301

Surgically Assisted Rapid Palatal Expansion and Mini-screw Assisted Rapid Palatal Expansion - A review

Dr. Vijay Kumar Vaghela

Orthodontist, Myra Dental Clinic, Ahmedabad, India

Email: v.k.vaghela@gmail.com

Abstract

Research summary: This review was undertaken to compare the effects of surgically assisted rapid palatal expansion (SARPE) and mini-screw assisted rapid palatal expansion (MARPE). Discrepancies in the transverse relation between maxillary and mandibular dentition can result in the development of posterior cross bite. For the correction of posterior cross bite, maxillary expansion is frequently undertaken. The conventional approach for maxillary expansion includes expansion screw being anchored to the maxillary teeth and is known as rapid palatal expansion (RPE) appliance. However, RPE can only be applied in growing individuals and is not as effective in late adolescents and adults. In such patients, surgically assisted rapid palatal expansion (SARPE) technique is used to expand the maxillary arch. As this procedure involves surgery, it deters many patients from choosing SARPE as a treatment option. Recently a non-surgical technique of expansion of maxillary arch has been introduced that can be applied to late adolescents and adults using palatal mini-screws. This technique is known as mini-screw assisted rapid palatal expansion (MARPE). In this review, the studies in the current literature regarding the SARPE and MARPE expansion techniques as compared to conventional RPE were included.

It was observed that both SARPE and MARPE are effective methods for achieving maxillary expansion. With both techniques being effective, the advantage of MARPE over SARPE is the non-surgical approach which leads to higher patient acceptance and lower rate of complications.

Keywords: Orthodontics, surgically assisted rapid palatal expansion, SARPE, MARPE Mini-screw assisted rapid palatal expansion, Surgical Orthodontics.

1. Introduction

Discrepancy in the transverse dimension between maxillary arch and mandibular arch can lead to the development of posterior crossbite either unilateral, or bilateral.^{1,2} The treatment of such a transverse discrepancy was reported first by Emerson Angell in 1860, where he described how the palatal expansion appliance can be used to apply transverse forces and open the mid palatal suture.³ After almost a century, Andrew Hass popularized the palatal expansion approach in the united states and reported that expansion appliances lead to increased arch-width of maxilla.⁴

Rapid palatal expansion (RPE) has been used in orthodontics commonly to correct such malocclusion nowadays. Rapid Palatal Expansion (RPE) is known by different names such as tooth-anchored expansion appliance, rapid maxillary expansion (RME). It is a useful appliance for the correction of posterior in young patients. But in patients over the age of 15 years, the RPE appliance can lead to decreased skeletal changes and higher dental effects such as buccal dental tipping of the molars, root resorption, and alveolar bone-loss.⁵ This happens due to the maturation of the mid-palatal suture in older age. Thus, in order to overcome the resistance of the mid-palatal suture, surgical approaches have been undertaken to increase the maxillary transverse dimension. Such approaches consist of segmental LeFort-I osteotomy and Surgically Assisted Rapid Palatal Expansion (SARPE).^{6,7}

Segmental LeFort-I osteotomy has been applied for correction of transverse discrepancy of 6-7 mm in maxilla. However, it has been reported to be unstable and a high tendency of relapse.⁶ Surgically assisted rapid palatal expansion (SARPE) was introduced by Brown in 1938 and has become a popular option since then for the treatment of transverse discrepancy in adults. The main objective with SARPE approach is to reduce the resistance rendered by midpalatal suture and lateral maxillary sutures so that a higher amount of skeletal expansion can be achieved. After performing the surgical procedure for the separation of the sutures, maxillary expansion is commonly achieved with the help of tooth-anchored expansion appliances for SARPE. This leads to similar side effects as conventional RPE such as dental tipping, root resorption, and periodontal issues. In addition, the surgical procedure deters many patients from choosing SARPE as a treatment option.

Because of these disadvantages, a non-surgical procedure that can lead to predictable opening of the mid-palatal suture was desired.

Thus, Mini-screw assisted rapid palatal expansion (MARPE) appliances were introduced to the orthodontic armamentarium. MARPE appliances are a relatively newer option for the correction of posterior crossbite and can be used to achieve higher amount of skeletal expansion of maxilla than conventional RPE.^{8, 9, 10} Different devices using mini-implants and maxillary expansion have been reported in the literature.¹¹ This review will describe the changes achieved with conventional RPE, SARPE, and MARPE.

2. Materials and methods

A thorough search of the literature was performed for the evaluation of studies investigating the effects of RPE, SARPE, and MARPE. The common parameters assessed for the evaluation of dental expansion were interpremolar width, intermolar width, and the width of nasal floor after MARPE and SARPE. Three dimensional radiographs such as cone-beam computed tomography scan (CBCT) is advantageous as compared to two dimensional radiographs such as lateral cephalometric radiograph and panoramic radiograph. Most of recent studies utilized Cone-beam computed tomography for the evaluation of the effects of the expansion appliances.

3. Results

The distance between the mesiobuccal cusp tips of maxillary first molar has been used to define the maxillary intermolar width.^{13, 14} In some studies, the distance between the central fossa of maxillary first molars has been used to define the maxillary intermolar width.⁸

Regardless of the method used for measurement, the difference between the pre-treatment and post-expansion are used to calculate the amount of the expansion.

Nada et al. performed a study in 2012 on patients who underwent surgical procedure for expansion of maxilla and observed that there was an increase of 5.64 mm +/- 2.9 mm in the intermolar width after expansion.¹³ Kayaler et al. in 2016 found that the width at maxillary molar region increased more than the width at maxillary premolar region when expansion was undertaken with mini-screw assisted rapid palatal expansion.¹⁴ In the studies on MARPE by Park et al and Lin et al, the maxillary intermolar width increased by 5.4 mm and 5.63 mm respectively.^{15, 16} But these studies only showed the short-term effects of expansion and long term effects of expansion were not analyzed in these studies.

Recently, a study conducted by Mehta et al. described the long term effects of mini-screw assisted rapid palatal expansion and conventional tooth-anchored rapid palatal expansion.⁸ This study was conducted on a sample from randomized controlled clinical trial on three groups : i) Mini-screw assisted rapid palatal expansion, ii) conventional rapid palatal expansion, and iii) controls.⁸ They showed in the study that the maxillary intermolar width increased by 4.51 mm (95% CI: 3.46 to 5.55) in the short-term and 5.24 (95% CI: 3.98 to 6.5 mm) in the long term in mini-screw assisted rapid palatal expansion. In the conventional rapid palatal expansion group, the maxillary intermolar width was found to be increased by 6.07 mm (95% CI: 5.09 mm to 7.05 mm) in the short term and 4.2 mm (95% CI: 3.13 mm to 5.27 mm) in the long term. In the control group, the maxillary intermolar width increased by 0.02 mm (95% CI: -0.16 to 0.21 mm) and 3.64 mm (95% CI: 2.52 to 4.75 mm).⁸

An important point to consider for the success of the MARPE appliance is the success rate of palatal mini-implants. As compared to buccal mini-implants, buccal shelf mini-implants, inter-radicular mini-implants, palatal mini-implants have the highest success rates. In addition, the expansion appliances are cemented either on teeth (RPE) or on mini-implants (MARPE).

4. Discussion

In this review, studies analyzing the effects of SARPE and MARPE were evaluated to find out which technique and appliance is better for orthodontic expansion.^{8,13-16} In this review, only the studies using Cone-beam Computed Tomography (CBCT) were included for the evaluation of the effects of expansion appliances. This is because CBCT can provide an accurate picture of expansion by comparing the parameters before and after expansion. a more sophisticated radiographic examination could be performed with micro-computed tomography (micro-CT). However, even though micro-CT can be used in animal studies, it cannot be utilized in human studies because of the amount of radiation and thus, the next closest technique to micro-CT for head and neck is CBCT, which has a lower radiation and a high accuracy. The research conducted on expansion appliances in earlier times used two-dimensional radiographs which can cause errors in assessment because of the errors of magnification in such radiographs. Furthermore, with two-dimensional radiographs, the head positioning errors can cause inaccuracies in measurement of maxillary and mandibular structures.¹⁷

With the introduction of mini-screws in the orthodontic field, the orthodontic biomechanics have undergone a significant evolution.¹⁸ Thus, in the newer studies, an increased emphasis has been put on researching the effects of mini-screws and orthodontic expansion appliances.¹⁹ It is vital to understand the anatomy and morphology of midpalatal suture and the effect of age on midpalatal suture. It has been reported that the midpalatal suture undergoes fusion with age.²⁰ Thus, with the fusion of midpalatal suture at higher age, it is imperative to understand that performing conventional rapid palatal expansion would not lead to opening of midpalatal suture. Because of this, higher dental effects would be observed in such patients in late adolescents or older. This would lead to undesirable results such as dental tipping of molars and root resorption. In such cases, a surgical option such as SARPE or a non-surgical option such as MARPE would be beneficial in opening the midpalatal suture and decrease the incidence of dental side effects.¹³ Also, it has been reported that MARPE does not cause side-effects to the mandibular condyle and glenoid fossa relationship.¹¹

In our review, all the studies showed that both treatment strategies SARPE and MARPE are effective in achieving maxillary expansion. These findings stand to reason that if both strategies are effective, why not opt for a non-surgical strategy such as MARPE in lieu of SARPE as it saves the patient the trauma and complication of undergoing a surgical procedure. Furthermore, in the short-term multiple studies showed that both SARPE MARPE led to a significant increase in the intermolar width.

However, it is necessary to examine the long-term findings as it would allow us to observe whether the short term changes with expansion are stable in the long term. The only study with long term follow up after MARPE as compared to RPE and controls was the one performed by Mehta et al.⁸ In this study, the authors found that the type of expansion with conventional RPE was triangular. However, with MARPE, a parallel expansion was observed.⁸ This is because as MARPE obtains anchorage from mini-implants and not from teeth.⁸ All the studies showed that within 3-6 months after expansion, the maxillary intermolar width increased with MARPE and SARPE.^{8,13-16} Mehta et al. had the longest follow up period of 2.5 years and showed that MARPE led to an increase in the maxillary intermolar width even after 2.5 years indicating that the results with MARPE are stable in the long term.⁸

Even with SARPE technique, the expansion can be undertaken with conventional tooth-anchored rapid palatal expansion appliance or mini-screw assisted rapid palatal expansion appliance.¹³ After SARPE, mini-screw assisted rapid palatal expansion appliance has been shown to cause parallel expansion and minimal side effects as opposed to conventional tooth-borne expansion appliance. However, the clinician's skills and experience with mini-implants and MARPE appliance play an important role in the success of the appliance. Each case should be evaluated separately to identify if MARPE appliance would be required or not.

The landscape of orthodontics is continually changing and mini-implants have definitely brought change in the way orthodontics is practiced. With the help of artificial imaging, in the future the evaluation of the radiographs could be automated for enhanced accuracy and decreased subjectivity.²¹ The future studies should focus on long term effects of expansion appliances and incorporating artificial intelligence can be incorporated for the evaluation of the outcomes of different orthodontic expansion appliances.

5. Conclusion

Maxillary intermolar width increased predictably with both surgically assisted rapid palatal expansion (SARPE) and mini-screw assisted rapid palatal expansion (MARPE) procedures. SARPE procedure involves surgical intervention of the maxilla whereas MARPE can be used as a non-surgical alternative to SARPE for the expansion of maxillary arch.

6. References

1. Harrison, J. E., & Ashby, D. (2000). Orthodontic treatment for posterior crossbites. The Cochrane database of systematic reviews, (2), CD000979.
2. Ramires, T., Maia, R. A., & Barone, J. R. (2008). Nasal cavity changes and the respiratory standard after maxillary expansion. Brazilian journal of otorhinolaryngology, 74(5), 763–769.
3. Angell, E. C. (1860). Treatment of irregularities of the permanent or adult teeth. Dental Cosmos 1: 540–544.

4. Hass A. J. (1961). Rapid expansion of the maxillary dental arch and nasal cavity by opening the midpalatal suture. *Angle Orthod* 31 (2): 73–90.
5. Lu, J., Gong, F. F., & Shen, G. (2006). Shanghai kou qiang yi xue = Shanghai journal of stomatology, 15(4), 363–366.
6. Starch-Jensen, T., & Blæhr, T. L. (2016). Transverse Expansion and Stability after Segmental Le Fort I Osteotomy versus Surgically Assisted Rapid Maxillary Expansion: a Systematic Review. *Journal of oral & maxillofacial research*, 7(4), e1.
7. Brown GVI. The surgery of oral and facial diseases and malformations: their diagnosis and treatment including plastic surgical reconstruction. London: Lea and Febiger; 1938.
8. Mehta, S., Wang, D., Kuo, C. L., Mu, J., Vich, M. L., Allareddy, V., Tadinada, A., & Yadav, S. (2021). Long-term effects of mini-screw-assisted rapid palatal expansion on airway. *The Angle orthodontist*, 91(2), 195–205.
9. Lee, K. J., Park, Y. C., Park, J. Y., & Hwang, W. S. (2010). Miniscrew-assisted nonsurgical palatal expansion before orthognathic surgery for a patient with severe mandibular prognathism. *American journal of orthodontics and dentofacial orthopedics : official publication of the American Association of Orthodontists, its constituent societies, and the American Board of Orthodontics*, 137(6), 830–839.
10. Park, J. J., Park, Y. C., Lee, K. J., Cha, J. Y., Tahk, J. H., & Choi, Y. J. (2017). Skeletal and dentoalveolar changes after miniscrew-assisted rapid palatal expansion in young adults: A cone-beam computed tomography study. *Korean journal of orthodontics*, 47(2), 77–86.
11. Mehta, S., Chen, P. J., Vich, M. L., Upadhyay, M., Tadinada, A., & Yadav, S. (2021). Bone-anchored versus tooth-anchored expansion appliances: Long-term effects on the condyle-fossa relationship. *Journal of the World federation of orthodontists*, S2212-4438(21)00031-X. Advance online publication. <https://doi.org/10.1016/j.ejwf.2021.07.001>.
12. Berco, M., Rigali, P. H., Jr, Miner, R. M., DeLuca, S., Anderson, N. K., & Will, L. A. (2009). Accuracy and reliability of linear cephalometric measurements from cone-beam

- computed tomography scans of a dry human skull. American journal of orthodontics and dentofacial orthopedics : official publication of the American Association of Orthodontists, its constituent societies, and the American Board of Orthodontics, 136(1), 17.e1–18.
13. Nada, R. M., Fudalej, P. S., Maal, T. J., Bergé, S. J., Mostafa, Y. A., & Kuijpers-Jagtman, A. M. (2012). Three-dimensional prospective evaluation of tooth-borne and bone-borne surgically assisted rapid maxillary expansion. Journal of cranio-maxillo-facial surgery : official publication of the European Association for Cranio-Maxillo-Facial Surgery, 40(8), 757–762.
 14. Kayalar, E., Schauseil, M., Kuvat, S. V., Emekli, U., & Fıratlı, S. (2016). Comparison of tooth-borne and hybrid devices in surgically assisted rapid maxillary expansion: A randomized clinical cone-beam computed tomography study. Journal of cranio-maxillo-facial surgery : official publication of the European Association for Cranio-Maxillo-Facial Surgery, 44(3), 285–293.
 15. Nojima, L. I., Nojima, M., Cunha, A., Guss, N. O., & Sant'Anna, E. F. (2018). Mini-implant selection protocol applied to MARPE. Dental press journal of orthodontics, 23(5), 93–101.
 16. Lim, H. M., Park, Y. C., Lee, K. J., Kim, K. H., & Choi, Y. J. (2017). Stability of dental, alveolar, and skeletal changes after miniscrew-assisted rapid palatal expansion. Korean journal of orthodontics, 47(5), 313–322.
 17. Mehta, S., Dresner, R., Gandhi, V., Chen, P. J., Allareddy, V., Kuo, C. L., Mu, J., & Yadav, S. (2020). Effect of positional errors on the accuracy of cervical vertebrae maturation assessment using CBCT and lateral cephalograms. Journal of the World federation of orthodontists, 9(4), 146–154.
 18. Kim, S. H., Hwang, Y. S., Ferreira, A., & Chung, K. R. (2009). Analysis of temporary skeletal anchorage devices used for en-masse retraction: a preliminary study. American journal of orthodontics and dentofacial orthopedics : official publication of the American Association of Orthodontists, its constituent societies, and the American Board of Orthodontics, 136(2), 268–276.

19. Dzingale, J., Mehta, S., Chen, P. J., & Yadav, S. (2020). Correction of Unilateral Posterior Crossbite with U-MARPE. *Turkish journal of orthodontics*, 33(3), 192–196.
20. Colonna, A., Cenedese, S., Sartorato, F., Spedicato, G. A., Siciliani, G., & Lombardo, L. (2021). Association of the mid-palatal suture morphology to the age and to its density: A CBCT retrospective comparative observational study. *International orthodontics*, 19(2), 235–242.
21. Mehta, S., Suhail, Y., Nelson, J., & Upadhyay M. (2021). Artificial Intelligence for radiographic image analysis. *Semin Orthod.* 27:109-120

Copyright © 2021 Dr. Vijay Kumar Vaghela, AJRSP. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY NC).

Doi: doi.org/10.52132/Ajrsp.e.2021.302

COVID-19 in Jeddah Islamic Port

(Ministry of Health, Kingdom of Saudi Arabia)

Nashwan M. Abdullah¹, Abdullah J. Alsahafi², Ahmed A. Osman³, Mohammed S. Alharbi^{1*},
Essa A. Aljehany¹, Adel S. Alghamdi¹, Tarek A. Alzahrani¹, Majed M. Alqarni¹, Hassan O.
Qahwaji¹, Ruwaida A. Aljazzar¹

¹ Health Surveillance Centers at Jeddah Islamic Port, Kingdom of Saudi Arabia

² Public Health Director, Jeddah Health Affairs, Kingdom of Saudi Arabia

³ Department of Health Education and Health Promotion, Faculty of Public Health and Health Informatics, Umm Al-Qura University, Kingdom of Saudi Arabia

*E-mail: malharbi26@moh.gov.sa

Abstract

Introduction: Health Surveillance Centers at Jeddah Islamic Port (HSCJIP) devised a plan consisting of preventive measures implemented alongside with several agencies to contend with COVID-19. We aimed to explore the experience of the Ministry of Health in Jeddah in terms of dealing with COVID-19 in the Jeddah Islamic Port (JIP) in 2020. **Methods:** This is a cross-sectional study using secondary data from the HSCJIP, the primary data of which have been collected as a part of routine health surveillance.

Results: HSCJIP identified 261 patients with 676 contacts and they performed 472 visits to thermal scans points and performed 106,633 thermal scans to the employee and visitors.

Discussion and conclusion: HSCJIP conducted an epidemiological investigation of positive cases and follow-up of contacts with quarantine of confirmed cases. Moreover, several infection control measures were applied such as thermal scans. Monitoring visits at government and private agencies at the port were required.

In quarantine facilities, there was a need to assign doctors, nurses, pharmacists, infection control specialists, and health management staff and to define their tasks and coordinate their activities during work. There was also a need for HSCJIP to apply all environmental sanitation and infection control requirements to the quarantine facilities, with remarkable cooperation from the hotel administration, in order to meet all the needs of the medical team, including provision of medical files, medicines, personal protective equipment, forms and patient files of referral and follow-up cases, and preparation for requirements for the safe disposal of medical waste in patient rooms.

Keywords: COVID-19, Epidemic, Experience of MOH, Jeddah Islamic Port, Kingdom of Saudi Arabia.

1. Introduction:

Jeddah Islamic Port (JIP) has been identified as the second busiest seaport in the Middle East, handling about 4.1 million containers annually (Schwerdtfeger M , 2020). JIP is the largest port in the Kingdom of Saudi Arabia (KSA) and receives more than 65 % of the volume of all imports (Jeddah Islamic Port, 2020). This accomplishment has been achieved by its excellent location, its equipment, quality of its services, and diversity of its partnerships with the private sector, as it operates stations that have strengthened its pivotal role in the region and on the global trade map. JIP performs its daily activities according to the highest standards of environmental security and safety by observing the latest operational systems that keep up with international standards, with the assistance of qualified national human cadres of guides, observers, and marine inspectors who work around the clock.

The first cases of the coronavirus disease 2019 (COVID-19) were reported in China in December 2019 and since then had quickly spread to countries across the globe. COVID-19 has already been identified as a major health issue and has been responsible for more than 75 million reported cases and 1.6 million deaths globally as of December 22, 2020 (Who, 2020). In JIP, the first case of COVID-19 was identified on March 20, 2020.

To prevent the spread of this new COVID-19 pandemic in the Kingdom's ports, JIP worked in cooperation with the Ministry of Health (MOH) to implement an integrated plan prepared by the Saudi Ports Authority (SPA; Mawani), in line with the national efforts taken to prevent the entry and spread of this epidemic to KSA (Saudi Ministry of Health, 2020).

The Health Surveillance Centers at Jeddah Islamic Port (HSCJIP) devised a plan consisting of preventive measures taken against ships and vessels coming from affected countries. The SPA required shipping agents to inform HSCJIP electronically (via email) about ships and vessels coming from the affected countries 24 hours before their arrival. In addition, the plan stipulated that all ships were required to provide a health declaration, required documents, and data on all crew members and to ensure that no crew member had any symptoms of the disease. Moreover, HSCJIP coordinated with the General Directorate of Passports to require notification of the presence of any traveler who had been present in any of the affected countries within the previous 14 days (Saudi Ministry of Health, 2020).

The port administration has also established an operations room that linked all concerned departments to report any suspicion of the disease on the ship to HSCJIP. HSCJIP, in turn, sends all required information to the MOH before the ship arrives at the port, with the aim of ensuring the implementation of preventive measures according to the established plan, which was based on the national guidelines (Public Health Authority, 2020), and International Health Regulation IHR 2005 (World Health Organization, 2011). Moreover, the JIP preventive plan was designated in accordance with similar preventive plans and measures established by responsible authorities worldwide (TrainForTrade, 2020).

In this study, we aimed to explore the experience of HSCJIP in contending with COVID-19 in JIP in 2020.

Agencies Contributing to the Management of the COVID-19 Pandemic in JIP

List of Internal Contributors

Contributors to the management of COVID-19 included the Infectious Diseases Response and Crisis Management Committee at JIP, Department of Health Inspection on Ships, health center at the passenger station, clinics in the arrival and departure halls, pharmacy department, radiology department, quarantine hotel,

health survey and assessment team for workers' accommodations, rapid response team (RRT), investigation and contact follow-up team, health survey and workers' housing evaluation team, infection control team (ICT), regional laboratory, government hospitals, private hospitals, quarantine administration, comprehensive quality team, Department of Environmental Health, Public Health Department, Technical Affairs Committee, and the Financial and Administrative Affairs Committee and its affiliated sections.

List of External Contributors

External contributors included patients and their contacts (sailors, employees, and workers), JIP administration, a World Health Organization (WHO) representative, Saudi Food and Drug Authority, Saudi Central Board for Accreditation of Healthcare Institutes, Security Authorities, and other relevant authorities (border guard, passports office, customs office, intelligence office, investigation office, industrial security, civil defense, agents and shipping companies, the Emirate of Makkah Al-Mukarramah region, corporate housing, and school administration).

2. Methods:

Methods: This is a cross-sectional study using secondary data from the HSCJIP, the primary data of which have been collected as a part of routine health surveillance. We collected data related to the number of cases and distribution of age, number of contacts per each month, and the number of visits and temperature scans of the employee and visitors to JIP in the study period which extended from March to September 2020 in JIP, Jeddah KSA.

3. Results:

Achievements of the HSCJIP Department

HSCJIP has made the various achievements. They conducted case finding and management for employees and visitors in the port and documented them on a daily basis. The greatest number of cases and contacts were identified on the 24th epidemiological week from June 7 to 13, 2020 (26 cases and 59 contacts). The total number of identified cases in the JIP during the COVID-19 outbreak (from March to September 2020) was 261 cases and 676 contacts, the frequency distribution of the identified COVID-19 cases according to their nationality implied that the most cases were from Bangladesh (61 cases) whereas the least cases were from Sudan (4 cases). And the most cases were reported in the 24th epidemiological week as shown in Table 1&2.

Table 1. The frequency distribution of the identified COVID-19 cases according to their nationality (261 patients).

Country	Numbers
Bangladesh	61
India	48
Saudi Arabia	35
Pakistan	32
Sri Lanka	25
Nepal	23
Philippines	15
Egypt	10
Yemen	8
Sudan	4
Total	261

Table 2. Number of identified COVID-19 cases and their contacts by HSCJIP according to epidemiological week in 2020.

No.	EPI week*	No. of positive cases	No. of contacts
1	15	11	48
2	16	24	37
3	17	14	41
4	18	11	19
5	19	12	21
6	20	11	17
7	21	9	29
8	22	9	30
9	23	12	45

10	24	26	59
11	25	21	56
12	26	17	42
13	27	16	35
14	28	11	30
15	29	2	8
16	30	6	20
17	31	4	15
18	32	3	6
19	33	2	13
20	34	8	15
21	35	6	18
22	36	7	15
23	37	2	3
24	38	4	11
25	39	5	21
26	40	4	9
27	41	1	2
28	42	1	3
29	43	2	8
30	44	0	0
Total		261	676

*Epidemiological week.

Moreover, HSCJIP performed several infection control activities, such as performing thermal scans by the ICT at the internal and external thermal scan points and recording them. The greatest number of ICT visits and thermal scans occurred in June 2020 (111 visits and 24,078 thermal scans), with a total of 472 visits and 106,633 thermal scans, as shown in Table 3.

Table 3. Monthly report of the total number of ICT visits to the thermal scan points and total number of performed thermal scans in JIP.

Month	No. of ICT visits			No. of thermal scans		
	Internal	External	Total	Internal	External	Total
April	62	25	87	15680	6962	22642
May	62	41	103	13242	10658	23900
June	60	51	111	10609	13469	24078
July	49	45	94	13923	9960	23883
August	40	37	77	6380	5750	12130
Total	273	199	472	59834	46799	106633

Operations of HSCJIP

Collectively, these operations aim to prevent health risks that might affect public health, which include the following: health measures that apply to travelers, including early preparedness by devising plans to address public health risks, reviewing the traveler's destination and route, stopover activity, inspection of the international certificate of vaccination (for travelers who are required to vaccinate according to the epidemiological situation of their destination), observing the health status of travelers to discover suspected cases of any targeted diseases according to international guidelines, registering the destination of travelers and their place of residence in the KSA, applying isolation measures to discovered cases and administration of prompt treatment as required, identifying and observing contacts and notify the competent health authorities in the place of residence of the suspected cases and their contacts, provision of available vaccines and preventive drugs for travelers based on the epidemiological situation of their destination, following the guidelines according to response and reporting, and quarantining the required persons as determined by the health authority.

Other preventive measures that apply to conveyances, baggage, and postal parcels included inspection of the health status on the ships, inspection of international travel documents, controlling vectors and reservoirs, disinfecting and cleaning the terminal, quarantining the

suspected cases, panning the affected containers, and responding to health emergencies that might affect public health.

HSCJIP normally maintains a plan to deal with public health emergencies, and this plan was agreed upon by the concerned authorities, updated and integrated with national plans, and was made compatible with any other health plans. Moreover, the plan covered port-related services, clarified the roles assigned to each of the port's operating authorities, nominated a coordinators committee, determined the necessary contact points at all levels, and provided all means to make information available to the competent authorities. In addition, the plan contained ongoing training and emergency plan experience.

Tasks of the RRT

The RRT comprised a designated group of healthcare workers who could be assembled quickly to deliver healthcare expertise in response to a suspected case of infectious disease. HSCJIP has four RRT teams that work 24 hours each day. Each team consists of one doctor (who confirms the suspicion of disease, fills out the referral form, supervises the team, and assesses the severity of the case if it is critical), a nurse (who assists the doctor, takes vital signs, gives medication to the patient when needed, transports the patient through a safe path for emergency transport), a health inspector (who investigates contacts and obtains their data), and an infection control practitioner (who secures the area to deal with the cases, follows up with the team to ensure they are wearing personal protective equipment [PPE], and ensures safe disposal of medical waste). These team members established the case definition of suspected COVID-19 case as recommended by the MOH as "any patient with acute respiratory illness (sudden onset of at least one of the following: fever or recent history of fever, cough, or shortness of breath) and in the 14 days prior to symptom onset" (Public Health Authority, 2020).

Tasks of the Investigation and Contact Follow-up Teams

In the event of a suspected or confirmed case, the affected individual's work and home contacts are identified by the health inspector in the RRT, and all contacts of the suspected case are then identified and reported to the investigation team, who then completes the investigation by visiting the workplace to identify and isolate those who have come into contact with the confirmed case at the port.

Moreover, the investigation team inspects the isolation facilities to ensure they meet infection control standards and the contacts' compliance with quarantine. The follow-up team revises the sample results for contacts, communicates with all contacts on a daily basis to ensure their health status, and conducts a follow-up of the positive cases after they are discharged from isolation to ensure their health status and that they will not return to their work until 14 days have passed.

Tasks of ICT

In cooperation with the preventive team, the ICT is given the following tasks: create a plan to respond to infectious disease threats; ensures the readiness of the center's working teams and the level of coordination with the relevant authorities; assign a trained RRT to ensure readiness to deal with suspected cases 24 hours a day; train all workers in HSCJIP on basic infection control skills and the infectious disease response plan; conduct field visits to ensure the readiness of HSCJIP workers and their knowledge regarding how to deal with COVID-19 cases according to the plan; oversee the equipment supply in the isolation room at the medical center to isolate suspected cases; create a waiting area for respiratory cases at the medical center; provide PPE for workers in the relevant authorities; provide wall sanitizer stations in the passport area and passenger halls and entry gates; create a safe passage for workers to enter and exit through the port gates; conduct educational courses about the coronavirus for the port's operating authorities, methods of transmission and means of protection, training the operating authorities at the port (especially marine guides, passport officials, and customs officials) on how to disinfect and clean hands and wear appropriate PPE and dispose them in a safe manner; update plan, instructions, and forms according to the latest updates on the manuals issued by the MOH; and, lastly, prepare the quarantine hotel and ensures that it conforms to infection control standards.

Furthermore, the ICT assigns workers from the hotel and trains them on how to put on and remove PPE to deal with cases, provides PPE for hotel workers in the reception area, designates a laundry and laundry workers for the clothes of cases, distributes containers for medical waste in every room, creates a safe path for entering and leaving the case by placing red tape for the cases and green tape for the workers, trains workers on how to sterilize surfaces and the elevator after use, trains and supervises hotel employees to disinfect case rooms after discharge according to infection control standards, provides two refrigerators for storing medical waste and places these in a safe place, determines a safe area for taking samples,

coordinates and supervises the sampling process and cleans the area after samples are collected, performs daily rounds to ensure infection control standards are applied, supervises the transportation of medical waste, and cleans the safe path after the case transfer process.

Response Plan of HSCJIP for Dealing with a COVID-19 Outbreak

The management plan for a COVID-19 outbreak in JIP is divided into several stages.

First Stage (Proactive Actions)

The main aim of this stage is to prevent the entry of COVID-19 disease in JIP. This phase started in January 2020, when the WHO declared COVID-19 a public health emergency of international concern (Who, 2019). HSCJIP has already established plans and aims as well as flow charts to control and prevent the entry of this virus through the voyages of ships coming through the port. This stage consisted of the involvement and contribution of several teams.

Health Inspection Team for Ships Objective. HSCJIP applied the International Health Regulations procedures, infection control standards, and MOH guidelines in order to prevent and control the COVID-19 pandemic. Tasks of HSCJIP included ensuring the health status of the ship's crew 24 hours before the ship enters the port and communicating with it via a very-high-frequency wireless device 2 hours before docking. While the ship is berthed, the health inspection team ascends the ship, and crew is not allowed to board or disembark from the ship until the health status of all crew members is confirmed following a visual screening and thermal scanning of all crew members.

RRT Objective. The objective of the RRT is to ensure that the team is ready to work according to the response plan of the COVID-19 pandemic. Their tasks include considering all probable scenarios for case detection and conducting drills with all the relevant authorities.

ICT Objective. The goal of the ICT is to supervise the application of infection control standards to limit the spread of COVID-19. Their tasks include training all government departments and private companies on the basics of infection control and the correct way to wash hands and wear masks.

Objective of the Medical Center at the Passenger Terminal. The objective of the medical center at the passenger terminal is to apply the MOH guidelines to ensure early detection of suspected cases.

Tasks include provision of necessary requirements for implementing infection control standards, creating a screening point at the entrance of the center, and preparing an isolation room for suspected case.

Second Stage: Beginning of Reporting Cases

The main aim of this stage is to prevent the spread of COVID-19 disease among the crew. This stage began with the first suspected case discovered on the ship coming from Djibouti on March 20, 2020, when one sailor, a Tanzanian, became the first positive case of COVID-19 detected at the JIP. During this stage, the team was created to investigate and follow-up on contacts, in addition to supporting teams, and the tasks and goals were updated according to the needs of this stage, as follows:

Investigation and Contact Follow-up Team. The objective of this team is to apply the MOH guidelines to identify contacts. Their tasks include the initiation of an epidemiological investigation of positive cases at the port community level, with the completion of the epidemiological investigation form dedicated to COVID-19 cases; finding contacts and isolating them; and conducting daily follow-up for 14 days.

RRT Objective. The objective of the RRT is to prepare and respond to suspected COVID-19 cases at the port and to coordinate their transfer through a safe path for isolation. After the number of suspected cases increased, three teams were formed, equipped, and trained to support the first team, reaching a total of four teams to deal with suspected COVID-19 cases. Team members then report suspected cases received by the Health Inspection Department from various parties operating in the port. The health inspector instructs the notifying person to isolate the suspected case and determine his location and take a brief history regarding symptoms. Subsequently, the health inspector passes the report to the doctor in the assigned RRT. After the team arrives and the suspicion of disease is confirmed, the case is transferred directly to the hospital for isolation. This team takes the data of cases and all contacts and documents all information on the contact register form. Moreover, they ensure the safe disposal of case output and medical waste, disinfection of affected areas, and supervision of the disinfection of the ambulance.

Third Stage: Peak Incidence of Cases

The main aim of this stage is to prevent the spread of COVID-19 disease among port workers. The third stage began when confirmed and suspected cases started to appear in the first company. At this time, two teams were formed (a field survey and housing assessment team and hotel quarantine team). Their tasks and aims were updated according to the needs of this stage, as follows:

Field Survey and Housing Assessment Team Objective. The objective of this team is to apply the MOH guidelines in the early detection of suspected cases and to implement environmental sanitation and infection control standards in workers' accommodations. Their tasks include visiting the operating companies in the port and workers' accommodations for assessment, providing active surveillance of suspected cases and referring them to hospitals for sampling, and ensuring that confirmed cases are isolated.

Hotel Quarantine Team Objective. The aim of the hotel quarantine team is to apply the MOH guidelines and infection control standards to isolate positive and contact cases and to apply environmental sanitation standards in hotel quarantine. Their tasks include equipping the medical team in the hotel quarantine to serve cases and ensuring that cases are isolated according to infection control standards and MOH protocols.

Fourth Stage: The Return Plan (after the Peak)

The main goal of this stage was to implement all precautionary measures at the port under the slogan of carefully returning. This stage began when the KSA announced a return to normal life after lifting the total and partial curfew from all regions and cities of the KSA.

In response to the pandemic, HSCJIP began to set updated goals for this stage and to update the necessary plans accordingly to implement MOH standards regarding precautionary measures to enable return with caution.

Among the most important procedures that took place during this stage was HSCJIP's informing all parties operating in the port to apply precautionary requirements among employees, by placing screening points at entry gates and requiring employees to wear masks and gloves, preventing gatherings, supervising all companies operating in the port and the residences of their workers, and ensuring the implementation of all precautionary measures.

The field survey team and housing assessment team continued their work; the quarantine hotel was closed, and suspected and positive cases were transferred under the responsibility of their respective companies; furthermore, a mobile field team (roving team) was created, which conducted field visits to evaluate isolation housing for cases and ensured the implementation of infection control and environmental sanitation requirements for isolation rooms.

Quarantine Operating Procedures

Initial Preparation of Hotels for Case Isolation:

The MOH assigned certain hotels to serve as quarantine locations with special precautions. The preparation of these hotels was performed by assigning a team under the supervision of the head of the Infection Control Department to conduct regular visits to evaluate the hotel's facilities and ensure that they had implemented infection control standards and to conduct training sessions for all hotel staff about correct procedures for wearing PPE and their safe disposal. The environmental health team made continuous visits to the hotel to ensure that they had provided proper quality food to the guests, allocated a room to place medical waste, designated an area to obtain coronavirus swabs, equipped a nursing station with all the necessary medical equipment for emergency cases, placed a contact number for the medical clinic in all rooms, set aside a day for laundry service on each floor, placed a medical waste bin in all rooms and corridors, placed hand sanitizers in all hotel corridors, placed a name register at the entrance gate to record the name of every person who entered the hotel, and checked hotel employees at the start of their shift for increased temperatures or the presence of any symptoms of COVID-19.

Mechanism for Receiving Case Notifications

Notifications of COVID-19 cases were received from either the JIP companies or Public Health Office of the port employees with suspected cases.

Mechanism of Admitting Cases to the Quarantine Hotel

The operating companies at the port inform the head of the investigation team in case of a positive patient and coordinate transfer to the hotel for quarantine. The investigation team contacts the quarantine supervisor and informs him about the number of upcoming cases. The quarantine supervisor coordinates with the field supervisors to take the necessary precautions and wear PPE.

The field supervisor then prepares the hotel rooms in coordination with the hotel staff. When the case reaches quarantine, one of the nursing personnel receives the case at the entrance of the hotel and provides him with a mask and gloves to be worn and directs him through the safe path to the designated elevator to go up to the designated floor. The doctor and nursing staff receive the cases to evaluate them and take vital signs and then directs the case to the isolation room. The infection control specialist fully supervises the entry mechanism, ensures the application of infection control standards, and supervises the disinfection process for the path taken by the cases as well as the elevators.

Mechanism of Daily Follow-up

The medical team (doctors, nurses, and pharmacists) make daily rounds to monitor the health status of patients and ensure their medical needs. A patient follow-up file is created, which contains the recording schedule of daily vital signs in addition to the notes made by doctors and nurses. When there is an emergency case that requires transportation to the hospital, the doctor coordinates with the Crisis and Emergency Department to transfer critical cases to the hospital.

Mechanism of Discharging the Cases

After the case recovers, medical team informs the patient and his company about the date of discharge from quarantine and provides him with gloves and a face mask. They will then direct him/her through the safe path to the designated elevator and accompany him to board the bus. The infection control specialist supervises daily activities and ensures disinfection operations are carried out in accordance with infection control requirements.

4. Discussion and Conclusion:

Best Practices in Dealing with the COVID-19 Pandemic by HSCJIP

HSCJIP established an RRT, and they requested that all ships entering the port report the health status of all crew members and their destination and route before docking. They prevented contact with all ships coming by the companies operating at the port unless they were granted freedom of communication by the ships' health inspection team, established an epidemiological investigation team for cases, placed floor stickers to separate workers at the entry and exit gates of the port and when waiting for buses, supervised the workers' food halls and made sure that they were well prepared with precautionary measures, created spacing between workers,

closed noncompliant food halls, mandated companies to make drinking water coolers on the sidewalks and inside workers' housing to operate without the need to touch them hand, supplied disposable drinking cups, mandated companies to supply hand sanitizer, provided posters to increase the awareness of the disease in their languages, set fixed points for thermal scans at entry and exit, and established a hotel quarantine to isolate and follow-up cases. HSCJIP made several efforts to reduce the number of workers on site and to assign them to work remotely when possible.

Difficulties and Challenges Faced by HSCJIP in the JIP

Among the difficulties faced by HSCJIP was the shortage of health workers in the ports in comparison with the number of government departments and private companies and the number of employees and workers at the port. Another challenge was the lack of transportation for field visits and the absence of direct penalties from HSCJIP against companies that violated health requirements, resulting in the need to strength the regulations of nonresponsive companies.

Lessons Learned from the Pandemic

HSCJIP reached a consensus among port stakeholders regarding the importance of early preparedness for threats and challenges associated with disease outbreak. HSCJIP ensured the total reliance on the work staff at the site, spreading the spirit of challenge among them, increasing the initiative to distribute tasks among workers without waiting for external support, and activating and encouraging teamwork from all departments. HSCJIP emphasized the avoidance of direct contact with ships coming to port, except for the health inspection team who conducted thermal scanning of the crew.

There was a need for government and private agencies to conduct monitoring visits at the port to ensure the implementation of health precautions. The field survey of the accommodations of the companies' workers played an important role in greatly contributing to limiting the spread of infection in the vicinity of the port by preemptively making an assessment of the housing, conducting a thermal scanning of the workers, and discovering and isolating the suspected cases. A dedicated team of HSCJIP conducted an epidemiological investigation of positive cases and followed up contacts. They discovered the important role of quarantine in controlling the spread of the disease by designating a hotel to serve as a quarantine area for both positive and contact cases and operated it using health personnel of the site.

HSCJIP promoted community participation, as some companies responded very well and provided isolation buildings for contacts and suspected cases to limit the spread of infection in their facilities. Moreover, the SCJIP conducted a series of health education sessions for port workers and increased awareness about the pandemic by conducting educational courses and workshops on visual screening and how to use PPE by the ICT.

5. Future Plans

HSCJIP has worked vigorously to promote the role of training by attracting specialized cadres to conduct courses and workshops for health workers in terms of dealing with such a pandemic in the future. They have taken advantage of the existing cadres, especially the innovators during the pandemic, to continue the work of the field team and make periodic visits to assess workers' accommodations at the port. In the quarantine facilities, there is a need to assign doctors, nurses, pharmacists, infection control specialists, and health management personnel and to define their tasks and coordinate their activities during work. HSCJIP must also apply all environmental sanitation and infection control requirements to the quarantine facilities, with remarkable cooperation from the hotel administration, preparing for all the needs of the medical team, including access to medical files, medicines, PPE, and referral and follow-up case forms and patient files and preparing for the safe disposal of medical waste in patient rooms.

6. Statement of Ethics

Ethical approval to conduct this study was obtained from the Institutional review board, Jeddah, MOH, KSA. (IRB registration number with KASCT: KSA:H-02-J-002).

7. Conflict of Interest Statement

The authors have no conflicts of interest to declare.

8. Funding Sources

The authors declare that they received no funding resources for conducting this study.

9. Author Contributions

Author 1: conceptualization, method, writing - original draft preparation. Author 2: conceptualization, writing - reviewing, and editing. Author 3: data curation, writing - original

draft preparation, writing – reviewing, and editing. Author 4-10: conceptualization, method, data curation, and writing - original draft preparation.

10. References:

Schwerdtfeger M. (2020), the top ports in the Middle East - Port Technology International [internet]. Port technology International. Retrieved from:

<https://www.porttechnology.org/news/what-are-the-top-ports-in-the-middle-east/>.

Jeddah Islamic Port, (2020) Mawani. Retrieved from: <https://mawani.gov.sa/en-us/SAPorts/jeddah/Pages/default.aspx>.

Who (2020), Weekly epidemiological update. Retrieved from:

<https://www.who.int/publications/m/item/weekly-epidemiological-update---22-december-2020>

Saudi Ministry of Health (2020), Enforces MOH, A preventive plant to combat COVID-19 at maritime ports. Retrieved from:

<https://www.moh.gov.sa/en/Ministry/MediaCenter/News/Pages/News-2020-03-16-003.aspx>

Public Health Authority (2020), a guide for respiratory infection prevention and control for employees working in Saudi ports. Retrieved from: https://covid19.cdc.gov.sa/wp-content/uploads/2020/04/EN_Preventive-measures-of-COVID-19-in-ports.pdf.

World Health Organization (2011). Handbook for inspection of ships and issuance of ship sanitation certificates: international Health Regulations (2005). Geneva, Switzerland.

TrainForTrade (2020), Ports in the fight against COVID-19. Retrieved from:

<https://tft.unctad.org/ports-covid-19>.

Public Health Authority (2020), Coronavirus Disease 19 (COVID-19) guidelines March 2020.

Retrieved from: <https://covid19.cdc.gov.sa/wp-content/uploads/2020/03/Coronavirus-Disease-2019-Guidelines-v1.2.pdf.pdf>.

Who (2019), IHR Emergency Committee on Novel Coronavirus. (p. 2019-ncov); 2019-. nCoV).

Retrieved from: <https://www.who.int/director-general/speeches/detail/who-director-general-s-statement-on-ihr-emergency-committee-on-novel-coronavirus->.

Copyright © 2021 Nashwan M. Abdullah, Abdullah J. Alsahafi, Ahmed A. Osman, Mohammed S. Alharbi, Essa A. Aljehany, Adel S. Alghamdi, Tarek A. Alzahrani, Majed M. Alqarni, Hassan O. Qahwaji, Ruwaida A. Aljazzar, AJRSP. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY NC).

Doi: doi.org/10.52132/Ajrsp.e.2021.303

High Gain Microstrip Active Antenna utilizes as Transmitter and Receiver with Linear and Circular Polarization

Engr. AHMED. S. ALZAHRANI*,

Master of Electronics and Communications, Department of Electrical and Computer Engineering, King Abdulaziz University, Saudi Arabia¹

Prof. Adnan. M. AFFANDI

Professor, Department of Electrical and Computer Engineering, King Abdulaziz University, Saudi Arabia

*Email: asmz11@hotmail.com

Abstract

In this research paper, a high gain microstrip active antenna is operating as transmitter and receiver at the same time with linear and circular polarization operations. This proposed work contains five essential parts such as high gain and broadband applications. Firstly, mainly is dealing with passive patch antennas. These selected passive antennas enjoy both high gain and broadband applications. Part two intends to convert the selected passive patch antennas into an active antenna. Part three intended to improve the performances of the proposed active integrated antennas. Part four enhancement elements (which is known as parasitic elements) are utilized in order to increase the gain of selected antennas. Part five, this proposed active integrated antennas will be converted from linear polarization (LP) into circulation polarization (CP). All the selected antennas will simulate by using models of ADS Agilent.

Keywords: Microstrip, Antenna, Receiver, Transmitter, Linear and Circular Polarization.

1. Introduction

Modern technology is taking off at a breakneck speed towards providing the best antennas that provide the best advanced technology solutions to keep pace with continuous manufacturing based on high-gain antennas (Garg et al, 2001). The proposed antenna can design simultaneous transmit and receive (STAR) antennas that can send and receive a signal simultaneously at the same time (Khoshniat et al, 2011). The antenna's intelligent design and integration with active circuits lead to innovative millimeter-wave and microwave application systems and considerable achievements in low power consumption, small profile, compactness, low cost, and multiple applications (Rogier, Declercq, 2010). This technology caused new designs in military and industrial applications such as transceivers, radar communications, sensors, and wireless (Peter T. et al, 2007). The microstrip antenna is one of the most important devices used in RFID applications. Radio Frequency Identification (RFID) is one of the most recent technologies in the field of wireless communications. This advance should provide a very great service in terms of speed, diversity, and ease (T, Itoh, 1997).

This proposed paper's main task is to design a simulated active integrated antenna at microwave band from 2 -3 GHz frequency range to get high gain and wide bandwidth for replacing the duplexers circuit with a patch antenna and an active antenna. The patch antenna single and multiple will be selected according to their performance gain and bandwidth. Low noise amplifier one stage and cascade will be discussed theoretical according to of three terminals as an active part. also will use enhancement elements (which are known as parasitic elements) are utilized in order to increase the gain of selected antennas. we will use the ADS simulation program in this research.

2. Passive Antenna

In this work, the design of the desired antenna provides two steps: we first present the design of a rectangular patch antenna based on microstrip technology, and the second we will design a rectangular array patch antenna for obtaining a high gain and directivity of the desired antenna. Single Patch Antenna for the first step, we will start by studying the first antenna which is a single patch printed antenna. We will focus on the design based

on a small size at a resonant frequency of 2.45 GHz. Then we go perform a simulation to find internal parameters (S. parameters, bandwidth) and external characteristics (gain, directivity, and radiation pattern). To increase the total gain of the antenna and have bandwidth wider and taking advantage of the functionality of the radiation overlay of several radiating elements in the same direction, we suggest the second step, which is the more important in order to design an array of antennas grouping patches identical to our first patch antenna proposed in the first step.

The antenna structure proposed as, and shown in Figure 1, has the rectangular patch connected with 50 Ohm line feed. The lower plane and the ground plane are composed of a PEC material (Perfect Electric Conductor). The antenna substrate is FR4, which has a relative permittivity $\epsilon_r = 4.6$ and a dielectric loss tangent, $\tan \delta = 0.01$.

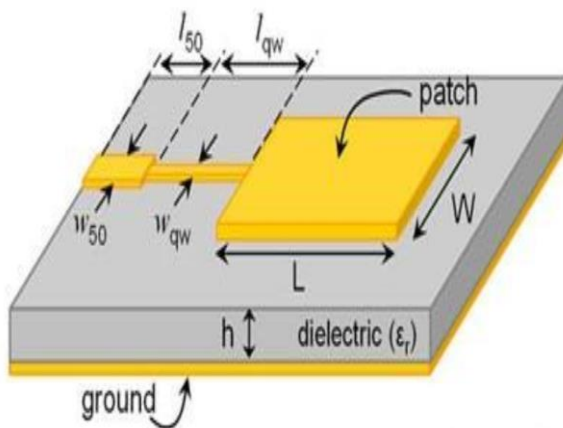


Figure.1 Microstrip Patch Antenna Configuration

For designing a microstrip patch antenna, we have to select the resonant frequency and a dielectric medium for which the antenna is to be designed. The geometry of the proposed patch antenna based on microstrip technology is depicted in figure 2. The dimensions to be calculated are shown in the table.1.

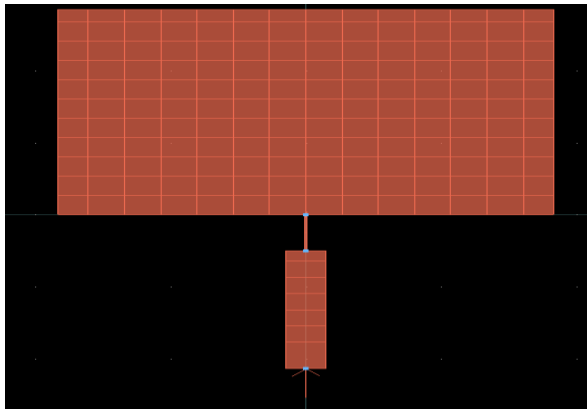


Figure.2 Layout of the single microstrip patch antenna

Table 1: The dimensions of the microstrip patch antenna

Parameters	Description	Value (mm)
hs	Thickness of substrate	1.58
hg	Thickness of ground	0.035
L	Length of patch	28.54
W	Width of patch	36.58
hp	Thickness of patch	0.035
Lfeed	Length of line feed	16.43
Wfeed	Width of the line feed	2.894
La	Length of adaptation	5
Wa	Width of adaptation	0.2

a) Array Patch Antenna

Design and Simulation of an array patch antenna at 2.45 GHz. The main idea in this step is together two identical elements of designing the patch antenna in order to increase the gain and the directivity of the desired antenna performances. Figure.3 shows the proposed structure of the used design.

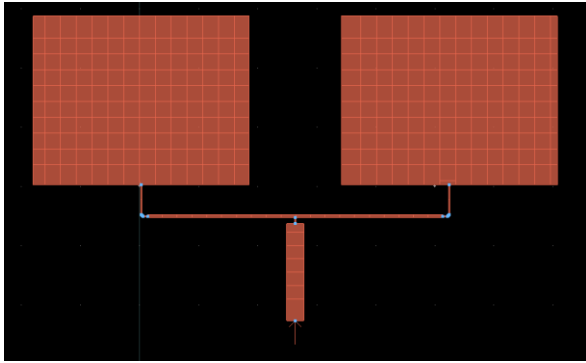


Figure.3 Layout of the array microstrip patch antenna

The important parameter to be considered is the maximum transfer of power, return loss of the designed antennas obtained from ADS Agilent, Where S_{11} represents the amount of energy sent to the amount of energy reflected. Therefore, a graph of S_{11} of an antenna versus frequency is called its input reflection coefficient curve. It is shown in figure.4 for single patch antenna and figure.5 for array patch antenna that it has an impedance bandwidth for return loss less than -10 dB around at 2.45 GHz.

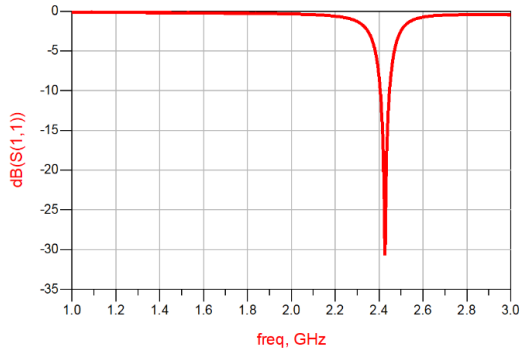


Fig.4. S_{11} of the proposed patch antenna resonating at 2.45 GHz

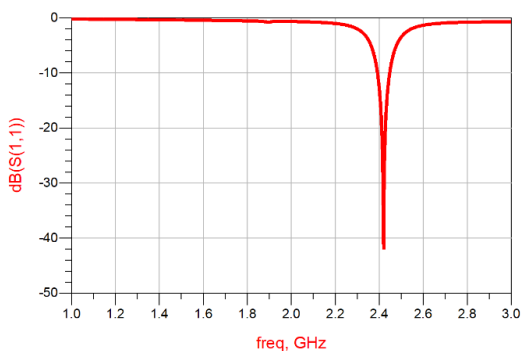


Fig.5. S_{11} of the proposed array patch antenna resonating at 2.45 GHz

The performance comparison between the designed single patch antenna and the array patch antenna is shown in Table 2. the table is shown simulation results for Return Loss (S11) values, VSWR, 3D directivity diagrams.

Table. 2: Comparison of microstrip patch antennas

Performances	Single patch antenna	Array patch antenna
S11 (dB)	-31.63	-42
BW (MHz)	128	170
Gain (dB)	3.24	5.75
Directivity (dB)	6.62	7.82
Radiation Efficiency (%)	49	62

From the analysis of this table, it can be seen that a designed antenna based on two elements provides good electrical performance. The work carried out in this project is in the field of the design, modeling, and simulation of printed antenna arrays for an important telecommunication application. The antenna network model to be simulated can be very useful for RFID applications.

3. Active Patch Antenna

The low noise amplifier LNA is one of the basic building blocks of a communication system responsible for shaping very weak signals from an antenna. It is usually located at the entrance of the receiver, to minimize line losses; therefore, it receives the signals directly from the antenna. The main function of a Low Noise Amplifier (LNA) is to amplify the signal while adding as little noise as possible. Since most commercial LNA circuits are often unstable and not matched to a standard impedance (such as 50), stabilization and matching networks are needed. In this case, the most critical requirement is the noise figure, which must be < 2.1 dB. The main objective is to design an amplifier with the simplest possible architecture, which should operate in the microwave band.

The circuit is a low noise amplifier (LNA) manufactured in InGaAs technology. The transistor used is the cf_ctk_CF00302_19930609. The two main parameters that must be taken into consideration are noise and gain. The simplicity of the LNA schematic should not make us forget that its realization is not dissociable from that of its constituent elements. The most suitable structure for a given need must therefore be sought, in terms of performance, surface area, and reproducibility. The analysis is done on a (2 -3) GHz frequency range. According to the figure.6, $k=1.583$ the determinant of the matrix S being $\Delta=0.248$; We have thus the factor K is greater than 1 ($K > 1$) and $\Delta < 1$ so we are in the case where the transistor is unconditionally stable. Then it is possible to simultaneously adapt the input and output of the quadrupole.

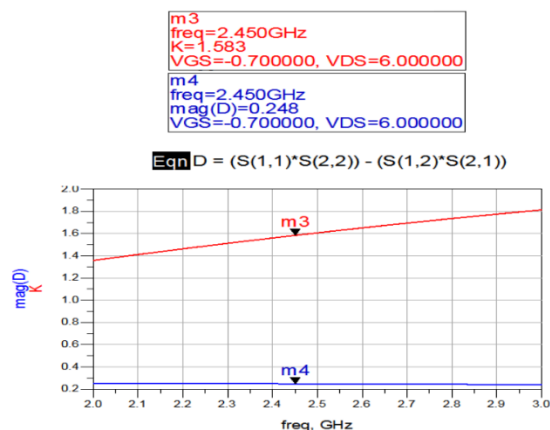


Figure 6. Simulated transistor stabilization response.

The matching network must adapt the input and output impedance of the transistor to the reference impedance of the measurement (50Ω) for this we add the matching circuits in input and output. when be Integrating the obtained circuits to our configuration, we obtain a low noise amplifier circuit adapted to its input and output in figure.7.

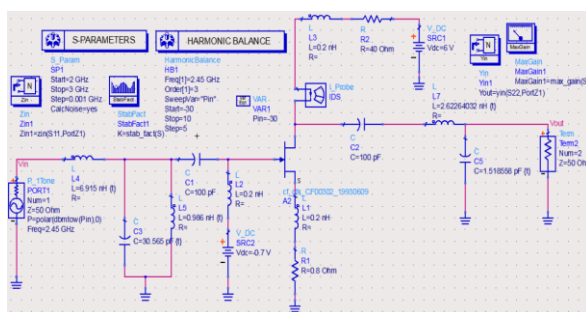


Figure 7. low noise amplifier circuit

After completion design of a low noise amplifier in the microwave band at an operating frequency of 2.45 GHz, and determine the operating point of our transistor. The results allow obtained us to make an inference on the chosen transistor. The proposed design must provide a compromise between low power consumption, a minimum noise factor, and a high gain. In a second time, we proceeded to the adaptation of our low noise amplified by the addition of adaptation circuits at the input and at the output. From figure (8-9), We obtained a low noise figure around 0.42 and a gain of 37.246.

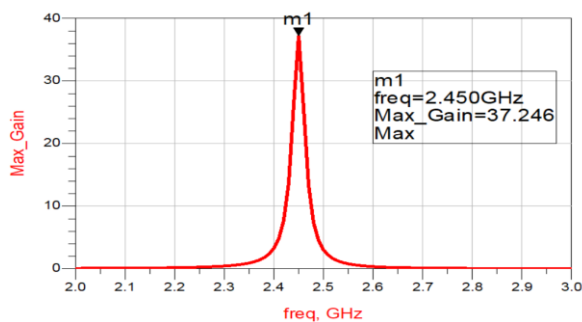


Figure.8 Simulated maximum gain parameter in LNA.

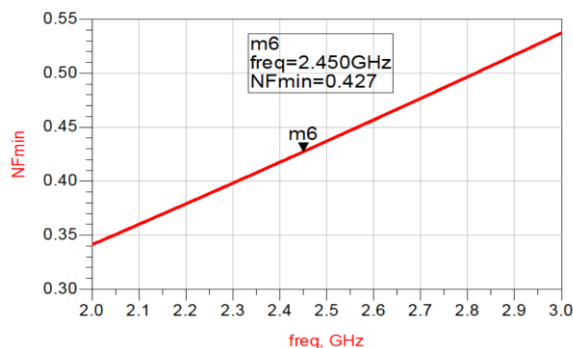


Figure.9 Simulated a low noise in LNA.

From figure.10, the curve of variation of the input and output signals of the amplifier, we can see that the output signal of the amplifier is sinusoidal and well amplified compared to its input signal.

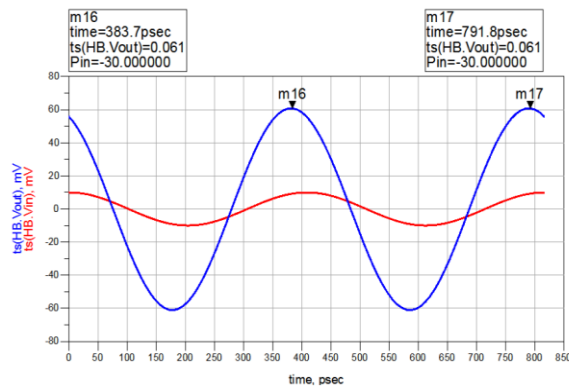


Figure.10 Comparison of the output and input signals of the amplifier in the time domain.

4. Active integrated antennas

The Active Integrated Antenna (AIA) design is shown in figure.11. The active integrated antenna consists of two parts. Part one is dealing with the active element while part two is dealing with the passive elements

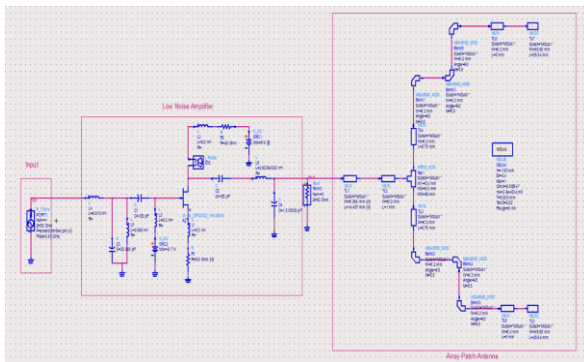


Figure.11 Active Integrated Antenna System

The active integrated antenna has been designed at the frequency of 2.45 GHz. In the proposed antenna, we have followed the mathematical approach of the transmission line model (TLM) where the important parameters are the resonant frequency (f_0), the dielectric constant (ϵ_r) and the height of the substrate (h). As a result, the designed antenna (AIA) consists of:

- Array Patch Antenna based on Microstrip Technology
- Low Noise Amplifier based on AsGa Mosfet Transistor

From the analysis of the obtained simulation results, we are able to determine the reflection and transmission coefficients of the active integrated antenna. Table.3 resumes all obtained performance for the designed AIA system.

Table. 3 Performance summary of the designed AIA system

Parameters	Values
S11 (dB)	-52.076
S22 (dB)	-42.729
S12 (dB)	-24.753
S21 (dB)	15.64
Gain	36.682
NFmin	0.430

5. Improvement the Gain of Active Integrated Antenna System

In order to increase the obtained gain and increase its value, will add some enhancement elements (parasite elements) in the designed AIA system as the integration of the parasitic capacitor exactly in the LNA part (active antenna) for increasing the gain. One of the important parasitic elements for improving the gain of the designed circuit is the inductor element. We can also change the value of VDS applied voltage in drain for increasing the gain.

Table. 4 Performance summary after add some enhancement elements in the designed AIA system

Parameters	Values
S11 (dB)	-30.58
S22 (dB)	-21.39
S12 (dB)	-24.35

S21 (dB)	16.69
Gain	46.71
NFmin	0.37

Regarding table.4 it can be seen that all used parasitic elements increases the gain; we obtained an excellent gain around 46 with low noise factor (0.37).

5. Circular polarization using defected patch structure (slot)

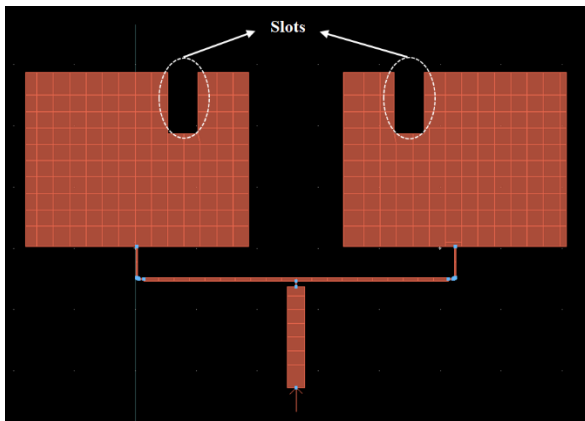


Figure.12 Layout of slots integration in the array patch antenna structure

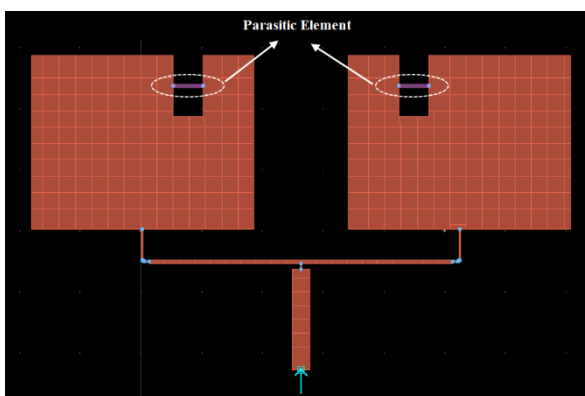


Figure.13 Layout of parasitic elements with slots integration in the array patch antenna structure

One method that can use to improve the gain of the desired active integrated antenna (AIA) is circular polarization. Figure.12 presents the slots integration in the array patch antenna structure. These slots will be perturbing the current for increasing the gain. The next step is to integrate the parasitic elements (capacitor) in the design slots as shown the figure.13.

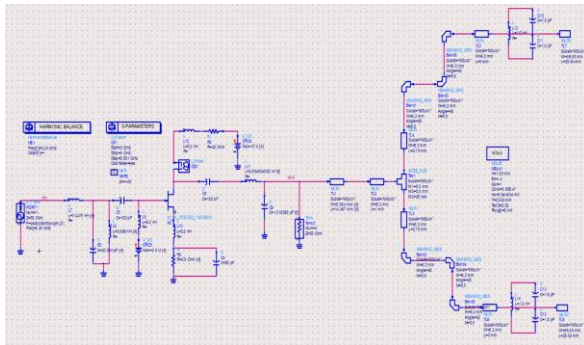


Figure.14 Final designed of AIA system

Figure.14 present the final designed active integrated antenna system after adding circular polarization and parasitic elements in the array microstrip patch antenna. From the analysis of the results in table.5 it can be seen that the gain increase to 47 and the reflection parameter S22 increase to -46.58 dB. This is why the circular polarization and the parasitic elements have allowed us to obtain the desired performances.

Table. 5 Performance summary final of AIA system

Parameters	Values
S11 (dB)	-25.79
S22 (dB)	-46.58
S12 (dB)	-24.32
S21 (dB)	16.721
Gain	47.0
NFmin	0.37

The adaptation of the system for validate the results obtained in terms of the input and output impedance. From Analysis of these results, we observed the input and output impedance are fixed in 50 Ohm. Which shows that the designed system is well adapted.

For a radio (transmitter or receiver) to deliver power to an antenna, the impedance of the radio and transmission line must be well matched to the antenna's impedance. The parameter VSWR is a measure that numerically describes how well the antenna is impedance matched to the radio or transmission line it is connected to.

From analysis of the obtained results about the VSWR parameter, we have a good value in transmitting and receiving the data. This parameter must be ($1 < \text{VSWR} < 2$).

- In transmission of data: $\text{VSWR} = 1.06$

- In receiving of data: $\text{VSWR} = 1.186$

The Group Delay variations versus frequency is an essential factor which can cause distortion and degradation in the data, which are used for transmitting and receiving the data with low delay possible.

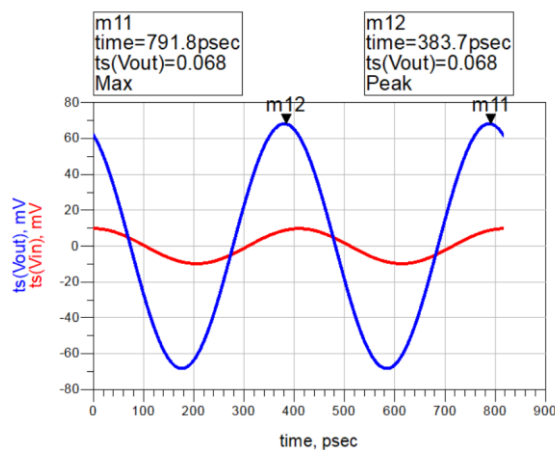


Figure.15 Comparison of the output and input signals of final of AIA system in the time domain

The figure.15 presents the signals at the input and output of the designed AIA system in the time domain.

From the curve of variation of the input and output signals of the Active Integrated Antenna we can see that the output signal of the AIA has the same frequency compared to its input signal.

5. Conclusion

In this paper, a novel Active Integrated Antenna AIA was proposed for the communication applications at microwave band from 2 -3 GHz frequency range to get high gain microstrip active antenna utilizes as transmitter and receiver as the same time and focused on the design based on a small size at a resonant frequency of 2.45 GHz. To prove the concept, firstly presented the design of the passive patch antenna that contains two parts based on microstrip technology for obtaining a high gain and directivity of the desired antenna. In the second step, the low noise amplifier LNA is designed to amplify the signal while adding as little noise as possible with the simplest possible architecture. after completing the design of a low noise amplifier and determine the operating point of our transistor at an operating frequency of 2.45 GHz, the results were obtained to make an inference on the chosen transistor a compromise between low power consumption, a minimum noise factor, and a high gain. We obtained a low noise figure around 0.42 and a gain of 37.246. In the next step, we combined the passive antenna with the active antenna to get an active integration antenna AIA. for Improvement the gain of the active integrated antenna system, we increased the obtained gain and increase its value by adding enhancement elements (parasite elements) in the designed AIA system as the integration of the parasitic capacitor in the AIA circuit for increasing the gain. after applying circulation polarization (CP) we obtained an excellent gain of around 47 with a low noise factor (0.37).

6. Acknowledgment

Co-Prof. Mohammad Nasser Ajour is grateful for the support provided during writing a master's thesis

7. Reference

Garg et al. (2001), Microstrip Antenna Design Handbook, Artech House.

Khoshnati et al. (2011), A linearly polarized active integrated square microstrip patch antenna, Antennas and Propagation (APSURSI), pp.3082-3084. IEEE.

Rogier, Declercq (2010), Active Integrated Wearable Textile Antenna With Optimized Noise Characteristics, Antennas and Propagation. pp.3050 -3054, IEEE.

Peter T. et al. (2007), Design of low noise amplifier with Active Integrated Antenna at 5 GHz", Applied Electromagnetics, APACE 07, pp.1-5, IEEE.

T, Itoh (1997), Active Integrated Antennas for Wireless Applications", Microwave conference proceedings, APMC, vol.1, pp.309-312, AsiaPacific, IEEE.

Copyright © 2021 Engr. AHMED. S. ALZHRANI, Prof. ADNAN. M. AFFANDI, AJRSP.
This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY NC).

Doi: doi.org/10.52132/Ajrsp.e.2021.304

Estimation of Some Physico-Chemical Parameters of Tannery Effluents to Surrounding Environment (A Yemeni Case Study)

Adel A. M. Saeed ^{1,*}, Nasser M. N. Masood², and Ali N. A. Al-Kumi²

¹Department of Chemistry/Faculty of Science, University of Aden, Khormaksar, Aden, Yemen

Email: adel_saeed73@yahoo.com, ORCID iD: 0000-0002-1154-2994

²Department of Chemistry/Faculty of Education, University of Abyan, Lawdar, Abyan, Yemen

Abstract:

Water pollution caused by leather industrial effluent discharges has become a troublesome phenomenon due to its negative impact on environmental health and safety. In this paper, the wastewater in the vicinity of Lawdar tannery areas was assessed in two years from October 2019 to June 2021 to determine physico-chemical parameters of industrial effluents of Lawdar tannery at four different area points. Tannery effluents were collected and all samples were analyzed in the laboratory and rated as no freshwater with parameters such as acidity and basicity, temperature, electrical conductivity, total dissolved solids, total suspended solids, chemical oxygen demand, biological oxygen demand, color, turbidity, hardness, alkalinity, and several positive and negative ions. The investigation showed that all physico-chemical parameters were higher than the standard disposal limits of discharged water quality. The findings of this research will assist the government and tanneries in the treatment of wastewater before discharging to the environment and monitoring the dump sites with regards to disposal arrangement of the tannery effluents and environmental assessment.

Keywords: Physico-chemical parameters, Pollution analysis, Tannery effluents, Negative environmental impact, Yemeni study

المستخلص:

أصبح التلوث الناشئ عن تصريف المخلفات السائلة لصناعة الجلود ظاهرة مقلقة بسبب التأثير السلبي على صحة البيئة والأمان. في هذه الورقة البحثية، تم دراسة مخلفات مياه دباغة الجلود من البيئة المحيطة بمذبغة لودر لمدة سنتين في الفترة بين أكتوبر 2019م وحتى يونيو 2020م لتقدير الخواص الفيزيوكيميائية للمخلفات السائلة لمذبغة لودر. حللت العينات في المختبر لقياس بعض المؤشرات مثل الحرارة، درجة الحموضة، التوصيلية الكهربائية، اللون، العكارة، الذائبية الكلية للمواد الصلبة، المواد المعلقة الصلبة الكلية، القساوة، القلوية، بعض الأيونات السالبة والموجبة... إلخ. أظهر الاستقصاء أن المؤشرات الفيزيوكيميائية كانت أعلى من القيم القياسية لنوعية المياه المصروفة لهذا نوصي بمعالجة هذه المخلفات المائية قبل تصريفها للبيئة المحيطة كما نوصي بمراقبة أماكن التصريف لغرض التقييم البيئي.

الكلمات المفتاحية: المؤشرات الفيزيوكيميائية، تحليل التلوث، المياه المخلفة من الدباغة، التأثير السلبي على البيئة، دراسة يمنية

1. Introduction

Industry has become an integral part of modern society and has provided comforts to human beings. On the other hand, the production of waste is inevitable of industrial activities. Those wastes may cause a probable hazard to environment and human life when improperly treated, stored, transported or disposed of, or managed (Tariq et al., 2006; Sulieman et al., 2010). Tannery waste is generated in massive quantities during the route of tanning by leather industries throughout the world. It has been considered one of the most polluted industrial wastes and contains high amounts of pollutants which are very toxic to groundwater, plants, animals, and land (Raj et al., 1996). The tannery industry consumes massive volumes of water daily and, as a result, generates a large amount of liquid effluents. The discharge of several wet sub-processes of tanneries such as pickling, bathing, dyeing, tanning, and fat liquoring may pollute the environment strictly (Subramanyam and Sambamurthy, 2006). The characteristics of the release effluents differ significantly from tannery to tannery depending upon the amount of the requested products and the design efficiency of the tannery, chemicals used for a specific process, amount of water used, and type of final product produced by a tannery (Tadesse et al., 2017).

The current pattern of industrial activity alters the natural flow of materials and introduces several chemicals into the environment. The discharge of various inorganic and organic substances, toxic metallic compounds, biological oxidizable tanning materials, and large quantities of decomposing suspended matter is one of the key factors that exert negative influences on human life and the environment (Akan et al., 2007; Beg & Ali, 2008; Salah et al., 2012). High levels of pollutants in water cause an increase in chemical oxygen demand (COD), biological oxygen demand (BOD₅), total dissolved solids (TDS), and total suspended solids (TSS) and hence make such water unsuitable for drinking, irrigation, and aquatic organism (Tariq et al., 2006; Ling et al., 2012). For environmental and health reasons, several techniques, processes, and treatments were applied to the effluent and wastewater of leather tannery to reduce or remove the contaminants (Bhaduri, 2021; Saha & Azam 2021; Sponza, 2021; Sultana et al., 2021; Whitehead et al., 2021).

The objective of the recent study was to investigate tannery effluent composition to better understand the suitable treatment performance of the process and identify physical and chemical contaminants of concern. The outcomes of this work can guide future regulatory needs that will best protect environmental and public health. We selected a tannery located within the populated city of Lawdar, Abyan governorate/Yemen as our field site, and employed conventional physico-chemical water quality analysis to check the treatment process and the effluent.

We wish that this study can be an abundant resource and offer a pathway for leather industries in Yemen and other similar countries to understand the tannery effluent hazards, to check the wastewater with available limits standards, and to get familiar with effective treatment technologies of solid and liquid wastes.

2. Experimental Methodology

2.1. Location of the Study

The samples were taken from Lawdar district (situated in south-western Yemen and located in Abyan Governorate). The coordination of the study area (Figure1) falls in 13° 53'04.2"N 45° 51'48.9"E.

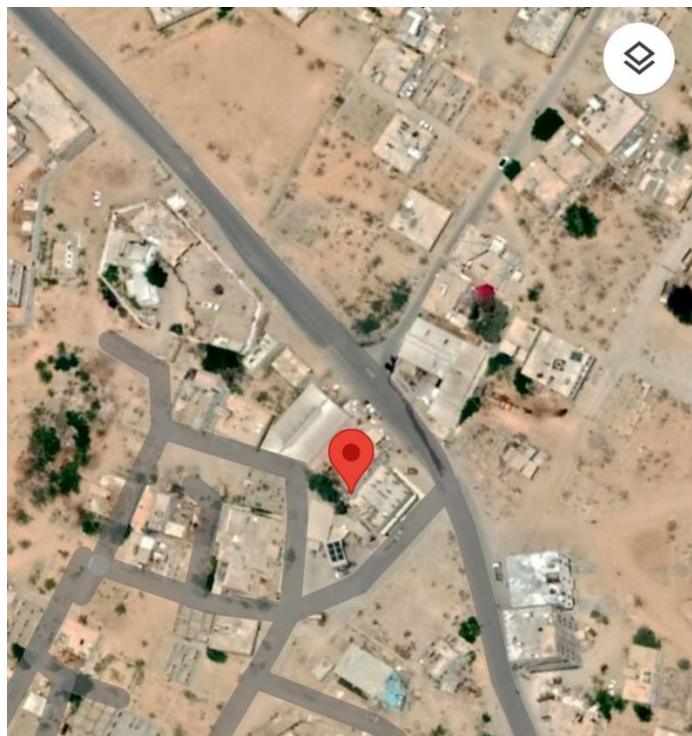


Figure1: Map showing study location.

2.2. Sampling

The wastewater samples of the tannery were collected during the period from October 2019 to June 2021. They were taken from a tank that was devoted for taking the wastewater from the tannery to the sewers in the area of the study. These samples were put in polythene bottles, and 100 ml were put after filtering those samples (Jeffery, 1996). The data set taken in this study is comprised of 23 parameters such as water temperature, acidity and basicity (pH), electrical conductivity (EC), color, turbidity, total dissolved solids (TDS), total alkalinity as CaCO_3 and as $\text{Ca}(\text{HCO}_3)_2$, total hardness as CaCO_3 , chemical oxygen demand (COD), biological oxygen demand (BOD_5), total suspended solids (TSS), dissolved ions such as calcium, magnesium, sodium, potassium, iron, manganese, nitrite, nitrate, chloride, fluoride, and sulfate ions. The temperature, pH, and electrical conductivity were measured for 30 minutes. The other discharged water quality parameters were determined within 82 hours except for BOD_5 , which was determined only after 5 days of incubation at 20°C . They were preserved in a fridge and taken to WETEX Water Systems Company -Aden-Yemen. The methods of analysis of water quality parameters were applied following (Jeffery, 1996; APHA, 2005) and summarized in Table (1).

SN	Parameters	Abbreviation	Unit	Analytical method	Instrument/Equipment
1	Temperature	Temp.	$^{\circ}\text{C}$	Electrometric	pH meter with Temp. probe
2	Acidity/ basicity	pH	---	Electrometric	pH meter with glass electrode
3	Electrical conductivity	EC	$\mu\text{S}/\text{cm}$	Electrometric	Conductivity meter with cell probe
4	Color	---	UTC	Photometric	Photometer
5	Turbidity	Turbidity	NTU	Turbidimetric	Turbidity meter
6	Total dissolved solids	TDS	mg/L	Electrometric	Conductivity/TDS meter
7	Total suspended solids	TSS	mg/L	Electrometric	Conductivity/TSS meter
8	Chemical oxygen demand	COD	mg/L	Digestion followed by titration	COD digester
9	Biochemical oxygen demand	BOD ₅	mg/L	5 days incubation at 20 $^{\circ}\text{C}$ followed by titration	BOD incubator
10	Total hardness as CaCO_3	Hardness	mg/L	Photometric	Photometer
11	Total alkalinity as CaCO_3	Alkalinity	mg/L	Photometric	Photometer
12	Total alkalinity $\text{Ca}(\text{HCO}_3)_2$	Alkalinity	mg/L	Photometric	Photometer
13	Chloride	Cl^-	mg/L	Photometric	Photometer
14	Nitrate	NO_3^-	mg/L	Photometric	Photometer
15	Nitrite	NO_2^-	mg/L	Photometric	Photometer

16	Fluoride	F ⁻	mg/L	Photometric	Photometer
17	Sulphate	SO ₄ ⁻²	mg/L	Turbidimetric	Turbidity meter
18	Sodium	Na ⁺	mg/L	Photometric	Photometer
19	Potassium	K ⁺	mg/L	Photometric	Photometer
20	Calcium	Ca ⁺²	mg/L	Photometric	Photometer
21	Magnesium	Mg ⁺²	mg/L	Photometric	Photometer
22	Iron	Fe ⁺³	mg/L	Photometric	Photometer
23	Manganese	Mn ⁺²	mg/L	Photometric	Photometer

Table 1: Analytical methods and equipment used in the study

2.3. Statistical Analysis

Statistical analysis was performed using SPSS Statistical Package v20. Data were expressed as mean, standard deviation (\pm Sd), standard error (\pm Sr), lower bound-upper bound, minimum-maximum (Min-Max) values. and analysis of variance (ANOVA) was examined. The significant variation of the concentrations of the parameters in wastewater samples was tested at $p \geq 0.05$ (95% confidence level). The significant variation of the four different batches (i.e., S1, S2, S3 and S4) was analyzed to determine the mean distribution of the average concentration of the analyte along with the sampling sites and compare the arithmetic mean with the standard disposal limits (discharging inland). Then, a one-way ANOVA was adopted by assuming that there is no statistically significant difference between the sampling points and their variations which were taken from the same population (homogeneity of variance). The graphs were drawn using Origin Pro v9.6.0. A comparison between the results and the standard values were performed.

3. Results and Discussion

The results of the four examined samples are shown in Table (2) and Figures (2) and (3).

Table 2: Some Physico-chemical parameters of tannery effluents samples

		95% Confidence Interval for Mean		
--	--	----------------------------------	--	--

Parameter	N	Mean	Std. Deviation (\pm Sd)	Std. Error (\pm Sr)	Lower Bound	Upper Bound	Min	Max
Temperature (°C)	4	31.65	5.713	2.857	22.56	40.74	27.30	39.41
pH	4	8.325	2.165	1.083	4.879	11.77	5.40	10.20
E.C (μ s/cm)	4	62725	5856	2928	53407	72042	56060	70340
Color (UTC)	4	2000	163.3	81.65	1740	2259	1800	2200
Turbidity (NTU)	4	1040	93.81	46.90	890.7	1189	980.0	1180
TDS (mg/L)	4	4010	258.2	129.1	39689	40510	39800	40400
TSS (mg/L)	4	2245	206.8	103.4	1916	2574	2000	2500
COD (mg/L)	4	4450	443.5	221.7	3744	5156	4000	5000
BOD ₅ (mg/L)	4	2425	543.9	271.9	1559	3290	2000	3200
Total Hardness as CaCO ₃ (mg/L)	4	8000	326.6	163.3	7480	8519	7600	8400
Total alkalinity as CaCO ₃ (mg/L)	4	17000	163.3	81.65	16740	17259	16800	17200
Total alkalinity as Ca (HCO ₃) ₂ (mg/L)	4	20585	299.9	149.9	20107	21062	20160	20840
Chlorides (mg/L)	4	19630	124.9	62.45	19431	19828	19500	19800
Nitrate(mg/L)	4	18000	163.3	81.65	17740	18259	17800	18200
Nitrite (mg/L)	4	100.0	16.33	8.165	74.01	125.9	80.00	120.0
Sulphates (mg/L)	4	4368	532.4	266.2	3521	5215	3800	5074

Fluorides (mg/L)	4	20.00	1.633	0.816	17.40	22.59	18.00	22.00
Sodium (mg/L)	4	18900	286.1	143.1	18444	19355	18500	19180
Potassium (mg/L)	4	380.0	16.33	8.165	354.0	405.9	360.0	400.0
Magnesium (mg/L)	4	1455	111.2	55.60	1278	1631	1380	1620
Calcium (mg/L)	4	880.0	16.33	8.164	854.0	905.9	860.0	900.0
Iron (mg/L)	4	2.075	0.299	0.149	1.599	2.550	1.80	2.50
Manganese (mg/L)	4	2.000	0.163	0.082	1.740	2.259	1.80	2.20

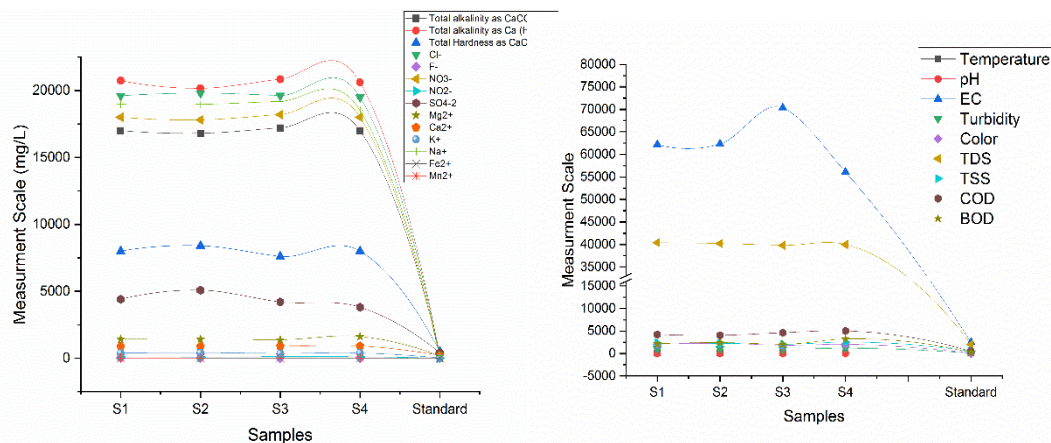


Figure 2: Concentrations of physico-chemical parameters in tannery wastewater effluent at different sampling points. Note: Separation parameters in two graphs was made for better visibility.

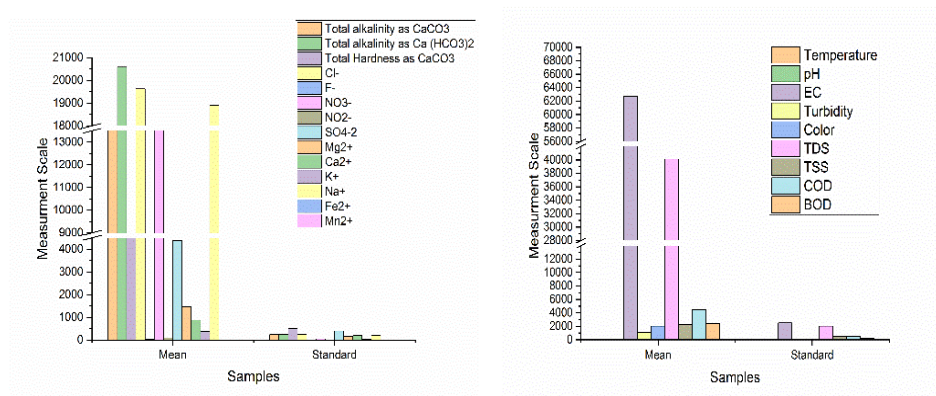


Figure 3: Mean concentrations comparison between physico-chemical parameters results and standard values in tannery wastewater effluent.

Temperature, pH, and EC

The temperature of leather tannery effluents was taken directly after drainage within the range (27.30-39.41 °C) and an average of (31.65 °C) fits well the permissible limits (20-35 °C) of (NE, 1999). The results were ambient and almost equal to that of room temperature (30 °C ± 2 °C) when observed on the day of sample collection. Thus, the effluent was not thermally polluted.

Acidity and basicity of the effluent at several sample points ranged from 5.40 to 10.2 with the mean 8.32 slightly basic on pH scale. This was within the prescribed standard limits (6-8.5) (NE, 1999; WQR, 2006). The lowest pH value (i.e. 5.40) may be due to addition of sulphuric acid during the pickling stage. In contrast, the highest pH value (10.2) may be to the use of an excessive amount of lime and sodium sulfide in leather tannery processes.

The electrical conductivity of the effluent ranged from 56060 to 70340 µs/cm and the average electrical conductance was (62725 µs/cm) which was very much above the permissible limit (ISI, 2000; NEQS, 2000; Hasan et al., 2021). Electrical conductivity is an excellent indicator of ionic forms of dissolved salts which can affect the taste (Solaimali & Saravana Kumar, 2004; WHO, 2017). The tolerance limit of EC is 2500 µs/cm as suggested by (Tariq et al., 2006).

Color and Turbidity

The average color range of the composite tannery effluents was found to be 2000 Pt-Co units (2000 UTC) showing an orange color. This was about seven times higher than the maximum permissible limits (NE,1999).

The value of turbidity ranged from 980 to 1180 NTU with an average of (1040 NTU) greatly above the prescribed limit (NE1999; Owusu-Ansah et al, 2015). The high turbidity may increase effluent temperature due to particles absorbing sunlight and the organism and the non-organism suspended matters can scatter light and prevent plants from photosynthesis.

TDS and TSS

The range value (39800- 40400 mg/L) and the average (40100 mg/L) of total dissolved solids (TDS) was found to be more than three times above the tolerance limit prescribed by (NE,1999; WHO,2017) and hence it is necessary to be removed by effluent treatment before discharging to safeguard the environment.

The total suspended solids (TSS) of tannery effluent samples were 2100 to 2500 mg/L with a mean of 2245 mg/L. In fact, these values were higher 22 times than the permissible standard limits for effluent discharge (ISI, 2000). TSS potentially increases the sedimentation in wastewater, changes in soil porosity, and causes depletion of oxygen.

COD and BOD₅

The mean COD and BOD₅ of the effluents samples were in the range 4000-5000 mg/L and 2000-3200 mg/L, respectively. The results show that COD and BOD₅ values in the tannery effluents were 44 times higher than the maximum allowable limits in discharged effluents (NE,1999). Dissolved oxygen is an index of the total organic content of water oxygen demanding substance in water. It means an amount of oxygen required for oxidation of oxidizable organic matter. The COD is a more realistic parameter this indicates the pollution status of a water body as it is related to all organic matter present (WQM, 1999). On the other hand, BOD₅ is directly proportional to the decomposition of dead organic matter and can be correlated with pollution status present in the lake and hence the higher values of BOD₅ can be correlated with pollution status (BIS,1983; McCoy & Olson,1986; Yurteri & Gurol,1987).

Hardness and Alkalinity

It was observed from Table 2 that the concentration of total hardness, Ca-hardness, and total alkalinity were extremely high in comparison with the standard levels of discharging in the land (Hasan et al., 2021). The high levels of carbonates influence calcium so that magnesium ions become insoluble mineral, leaving sodium as dominant ions in solution. Increasing alkalinity of effluent can intensify soil conditions and can parallelly destroy the agriculture and can also affect the life cycle of animals and plants dependent on water (Bai et al., 2010; Hasan et al., 2021).

Free Ions

The average concentration of dissolved metal ions (i.e. Na, K, Mg, Ca, Fe, and Mn ions) in the leather tannery effluent exceeded the standard disposal limits (NE,1999; WHO,2017). The metal ions in this study were present in the following order: $\text{Na} > \text{Mg} > \text{Ca} > \text{K} > \text{Fe} > \text{Mn}$.

All the studied negative ions were extremely higher than max allowable limits (ISI,2000; Owusu-Ansah et al.,2015; WHO,2017) and they were in the order: $\text{Cl}^- > \text{NO}_3^- > \text{SO}_4^{2-} > \text{NO}_2^- > \text{F}^-$.

The very high concentrations of previous ions imply environmental pollution and may cause human illness and can disturb plant growth.

4. Conclusion

To conclude, characterization and determination of tannery effluent indicated a heavy load of pollutants. Tannery leather effluent in freshwater affects the quality of it while discharging effluent to soil can eliminate most of the rhizosphere fungi and can lead to fertility problem. The high levels of studied parameters (ICMR,1975; BIS,1983; Bai et al., 2010) have a negative influence on germination, plant growth, irrigation, and absorption of water and nutrients (ICMR 1975; BIS,2003; Solaimali & Saravana Kumar, 2004; Misra & Pandey, 2005; Shakunthala et al., 2010; WHO,2017). Therefore, the effluents from Lawdar tannery industry are not recommended for human activities unless appropriate treatments are selected.

5. References

- Akan, J. C., Moses, E. A., Ogugbuaja, V. O., & Abah, J. (2007). Assessment of tannery industrial effluents from Kano metropolis, Kano State, Nigeria. *Journal of Applied Sciences*, 7(19), 2788-2793.
- APHA (2005), *Standard Methods for Examination of Water and Wastewater*, (21 Edition), American Public Health Association, Washington D.C.
- Beg, K. R., & Ali, S. (2008). Chemical contaminants and toxicity of Ganga river sediment from up and down stream area at Kanpur. *American Journal of Environmental Sciences*, 4(4), 362.
- Bhaduri, M. (2021). Available techniques of wastewater management practices in Indian tanneries: A literature review. *Journal of Environmental Treatment Techniques*, 9(2), 491-498.
- BIS (2003). Bureau of Indian Standards, New Delhi IS: 10500:1991 edition- 2.2(2003-2009).
- Hasan, MM., Alam, AKMM., Haque AKMM, et al. (2021). Impacts of textile and leather effluent on environment: an assessment through life cycle of fishes and plants. *J Textile Eng Fashion Technol*. 7(3),111-117. <http://10.15406/jteft.2021.07.00276> .
- ICMR (1975). *Manual of Standards of Quality for Drinking Water Supplies*. Indian Council of Medical Research, Spl. Rep. Ser.No.44.
- ISI (2000) *Guide for Treatment and Disposal of Effluents of Tanning Industry*. Indian Standards Institution, New Delhi, India.
- Jeffery, G.H. (1996). *Vogel's Text Book of Quantitative Chemical Analysis* (5th Ed.) Addison Wesley, Longman Ltd., Harlow, England.
- Ling, T. Y., Dana, M. J., Bostam, S., & Nyanti, L. (2012). Domestic wastewater quality and pollutant loadings from urban housing areas. *Iranica Journal of Energy & Environment*, 3(2), 129-133.
- Mccoy, W. F., & Olson, B. H. (1986). Relationship among turbidity, particle counts and bacteriological quality within water distribution lines. *Water Research*, 20(8), 1023-1029.

Misra, V., & Pandey, S. D. (2005). Hazardous waste, impact on health and environment for development of better waste management strategies in future in India. *Environment international*, 31(3), 417-431.

NE (1999) National Environment, Standards for Discharge of Effluent into Water or on Land. Regulations, S.I. No 5, Uganda.

NEQS (2000), National Environmental Quality Standards for municipal and liquid industrial effluents.
<https://epd.punjab.gov.pk/system/files/Revised%20NEQS%202000.pdf> (Revised)
(Accessed 11 Sept, 2021).

Owusu-Ansah, E. D. G. J., Sampson, A., Amponsah, S. K., Abaidoo, R. C., & Hald, T. (2015). Performance, compliance and reliability of waste stabilization pond: effluent discharge quality and environmental protection agency standards in Ghana. *Res. J. Appl. Sci. Eng. Technol.*, 10(11), 1293-1302.

Raj, E. M., Sankaran, D. P., Sreenath, S. K., Kumaran, S., & Mohan, N. (1996). Studies on treated effluent characteristics of a few tanneries at Crompton, Madras. *Indian J. Environ. Prot.*, 16, 252-254.

Saha, B., & Azam, F. A. B. (2021). Probable ways of tannery's solid and liquid waste management in Bangladesh—An overview. *Textile & Leather Review*, 4(2), 76-95.
<https://doi.org/10.31881/TLR.2020.25>

Salah AW., Abdel Monem M. Ahmed M., M.S. Adam, and M.A. Mohamed (2013). Adsorption studies on the removal of hexavalent chromium contaminated wastewater using activated carbon and bentonite. *Asian Journal of Chemistry*; 25(15), 8245-8252.
<http://dx.doi.org/10.14233/ajchem.2013.13559>

Shakunthala, B., Shivanna, S., & Doddaiiah, S. (2010). Urban wastewater characteristic and its management in urban areas—a case study of Mysore City, Karnataka, India. *Journal of Water Resource and Protection*, 02(08), 717–726.

Solaimali, A. and Saravana Kumar, R. (2004). Irrigation with Poor Quality Water on Soil and Crop in Water Pollution Assessment and Management. Daya Publishing House, New Delhi. pp.407-4239.

Sponza, D. T. (2021). Treatment of leather industry wastewater with sequential forward osmosis (FO) and reverse osmosis (RO) hibrid prosesses and re-coveries of economical merit materials. J Nanosci Nanomed Nanobio 4: 008.

Subramanyam N.S., and Sambamurty A.V.S.S. Ecology, 2nd Ed. Narosa Publishing House, New Delhi 2006. 635 pages.

Sulieman, A. M. E. H., Yousif, A. W. M., & Mustafa, A. M. (2010). Chemical, physicochemical and physical properties of wastewater from the Sudanese fermentation industry (SFI). In Fourteenth International Water Technology Conference (Vol. 14, pp. 305-315).

Sultana, R., Ahmed, S., & Zohra, F. T. (2021). Development of adsorbent from sugarcane bagasse for the removal of pollutants from chrome tanning effluents. Textile & Leather Review, 4(2), 65-75. <https://doi.org/10.31881/TLR.2020.24> .

Tadesse, G. L., Guya, T. K., & Walabu, M. (2017). Impacts of tannery effluent on environments and human health: a review article. Advances in Life Science and Technology, 54, 10.

Tariq, M., Ali, M., & Shah, Z. J. S. E. (2006). Characteristics of industrial effluents and their possible impacts on quality of underground water. Soil Environ, 25(1), 64-69.

Whitehead, P. G., Mimouni, Z., Butterfield, D., Bussi, G., Hossain, M. A., Peters, R., ... & Ager, D. (2021). A new multibranch model for metals in river systems: Impacts and control of tannery wastes in Bangladesh. Sustainability, 13(6), 3556. <https://doi.org/10.3390/su13063556>

WHO (2017), World Health Organization. WHO Guidelines for Drinking-Water Quality, 4th ed.; incorporating the first addendum. Geneva, pp. 1–541.

WQM, Report, 1999. Annual Report on Water quality monitoring of upper and lower lakes Bhopal. Vol. I and II.

WQR (2006), Water Quality Regulations, Licence Application and Renewal as per Legal Notice 120, Kenya Gazette supplement No 68; 29th September, 2006. <http://www.fao.org/faolex/results/details/en/c/LEX-FAOC084962/> (Accessed 11 Sept, 2021).

Yurteri, C., & Gurol, M. D. (1987). Removal of dissolved organic contaminants by ozonation. Environmental progress, 6(4), 240-245.

Copyright © 2021 Adel A. M. Saeed, Nasser M. N. Masood, and Ali N. A. Al-Kumi, AJRSP. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY NC).

Doi: doi.org/10.52132/Ajrsp.e.2021.306

The Training Skills of Military Officers in Treating Al-Istiqlal University Students from the Viewpoint of the Students Themselves

Dr. Amer Saber Shehadeh

Assistant Professor, Al-Istiqlal University, Palestine

Email: amershehadeh2008@yahoo.com

Dr. Mohammad Taleb Dabous

Associate Professor, Al-Istiqlal University, Palestine

Email: mddabous@hotmail.com

Dr. Nader Taleb Shwamreh

Assistant Professor, Al-Istiqlal University, Palestine

Email: nshwamreh@yahoo.com

Abstract:

The study aimed to know the skills of military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves. In order to achieve the aim of the study, a tool was developed to measure the extent of the availability of human and self-skills by the training officers. The tool is a questionnaire which included (33) items distributed on two axes and six domains.

The study was conducted on a random sample consisting of (225) male and female students from Al-Istiqlal University students. After collecting the data of the study, they were statistically treated by using the Statistical Packages for Social Sciences program (SPSS). The study reached a number of results the most important of which was that the degree of the availability of human and self-skills by the training officers from the viewpoint of the students themselves was medium.

The results also showed that there are no statistically significant differences at the significance level of ($\alpha \leq 0.05$) in the degree of the availability of the self and human skills by the training officers in the security apparatuses in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves which are due to the variable of gender, whereas there were statistically significant differences in the variable of the faculty in the axis of the self-skills in favour of the medium community college as compared with the faculty of human sciences and the faculty of administrative sciences. Also there were statistically significant differences in the variable of the study year level in all the axes of the study and the total degree in favour of the first year as compared with the students of the third and fourth years, and in favour of the second year over the third year.

Keywords: Skill, Military Training Officers, Al-Istiqlal University

المخلص

هدفت الدراسة إلى التعرف على مهارات ضباط التدريب العسكري في التعامل مع طلبة جامعة الاستقلال من وجهة نظر الطلبة أنفسهم، ولتحقيق هدف الدراسة تم تطوير أداة لقياس مدى توفر المهارات الإنسانية والذاتية لدى ضباط التدريب وهي عبارة عن استبانة، اشتملت على (33) فقرة، موزعة على محورين وستة مجالات.

أجريت الدراسة على عينة عشوائية مكونة من (225) طالبا وطالبة من طلاب جامعة الاستقلال. وبعد جمع بيانات الدراسة، عولجت إحصائياً باستخدام برنامج الرزم الإحصائية للعلوم الاجتماعية (SPSS). وقد توصلت الدراسة إلى مجموعة من النتائج كان من أهمها أن درجة توفر المهارات الإنسانية والذاتية عند ضباط التدريب من وجهة نظر الطلبة أنفسهم كانت متوسطة. كما أظهرت النتائج بأنه لا يوجد فروق ذات دلالة إحصائية عند مستوى الدلالة ($\alpha \leq 0.05$) في درجة توفر المهارات الذاتية والإنسانية لدى ضباط التدريب في الأجهزة الأمنية في التعامل مع طلبة جامعة الاستقلال من وجهة نظر الطلبة أنفسهم تعزى لمتغير الجنس، في حين كان هناك فروق ذات دلالة إحصائية في متغير الكلية في محور المهارات الذاتية لصالح كلية المجتمع المتوسطة مقارنة بكليتي العلوم الإنسانية والإدارية. كذلك وجدت فروق ذات دلالة إحصائية في متغير مستوى السنة الدراسية في جميع محاور الدراسة والدرجة الكلية ولصالح سنة أولى مقارنة بطلاب سنة ثالثة ورابعة، ولصالح سنة ثانية على سنة ثالثة.

الكلمات المفتاحية: مهارة، ضباط التدريب العسكري، جامعة الاستقلال.

1. Theoretical background

The training and rehabilitation of human cadres in all domains of life is considered the basis for any successful work. It is the thing which achieves development and advancement in all the sectors of the state, whether this is in the training or teaching or the defence affairs or the production or service affairs or others of the remaining sectors.

Training is defined as a process which is built on a precise organizing through which the experiences and knowledge are transferred to increase the skills and information of those who are targeted by training or to change their behaviours and convictions to achieve the main aims of the training the realization of which depends on the degree of efficiency of the trainers and leaders and their exerted efforts.

Because the level of training and its attaining its purpose cannot be advanced in the absence of a strategy which sets before its eyes the building of the officer, the non-commissioned officer and the soldier on a sound and developed basis which implants sacrifice and redemption in their spirits. Training in the military and the security sides has been considered one of the basic props on which the security forces, and the administrative technical units which aid them are built, and which aims to develop all the planning abilities and develop the skills and knowledge of the officers, non-commissioned officers and soldiers in all their specializations. It is also interested in rectifying and changing the behaviours of security personnel and to make the training programs which are generally adopted succeed. This depends on rehabilitating, empowering and making the trainers and leaders acquire skills, knowledge and abilities which are emulated by the trainee students (Kurdieh, 2011; Al-Tanani, 2010).

There are many theories which include the properties which must be available in the leader or the official or the trainer. Among these theories is the theory of traits which is based on that there is a number of traits and properties which, if they are available in the person, then he is qualified to become a leader (Sheeha, 1983 & Darweesh, 1988). Some are bodily such as: height, age, and weight. Some are mental such as: intelligence, memory power and thinking. Some are affective such as: emotional maturity, and some are social such as: establishing good contacts with the group (Othman, 1997). This is what Kan'aan, 1985 & Shareef, 1987) and many other have indicated.

Situation theory which indicates that the effect of the leader on the individuals of the group is connected to a certain situation in a certain circumstance (Humaid & Al-Ma'aaz, 1986 & Al-Waheebi, 2005). In this connection, Al-Tajm & Al-Sewat, 1995) added that the situations are the ones which make leaders. As for the interactive theory, it combines between the two previous theories whereby it indicates the interaction of with personality traits with the elements of the situation and the properties of the group. (Al-Jayyousi & Jad-Allah, 2000).

It is worth mentioning that the successful officer who enjoys human and self-skills in addition to commitment to the good rules of military control and connection has a basic and active role in raising the morale of the elements of the fighting units and formations, in addition to increasing the confidence of the individuals in themselves and in their leadership. Therefore, complete precision should be intended when choosing the proficient trainers who are professionals for the training task whether they are from the same teaching institution or by seeking the help of trainers from other institutions or other units (Matin and others, 2010; Dosh, 2006; Al-Thuwaiby, 2005).

Also the success of the training process does not depend only on the teaching material or the furnishings and the facilities only, rather it is concentrated in a bigger form in the proficiency of the trainer, his intelligence and his good conduct. (Military Training Commission-Palestine 14/3/2020). <http://www.gmtc.sec.ps/>

Also military training makes the person accustomed to patience and bearing and it develops quick intuition. It works on implanting the values of discipline, loyalty, intrepidity and group work, as well as reinforcing self-confidence, and subsequently, it contributes in building the active military personality. (Sultan Qaboos Academy for Police Sciences 14/3/2020) <http://sqaps.edu.com/?p=3442>

There is no agreement on what the military and security training means to the persons and trainees. The points of view differed and they were distributed on the following qualities: discipline, prior preparation, group performance and effectiveness. (Flethcher & Chatelier, 2000). What follows are some traits and skills which the leaders and the trainees should have and acquire:

1. Loyalty, faithfulness and sincerity: Loyalty to God, the homeland and the people and no others. As a leader he should reflect in all his conduct sincerity and loyalty to his

subordinates and to his military institution in which he works. So the faith of the leader in his God, his homeland, his nation and his question which he defends should be deep.

2. Tactfulness and good treatment of the subordinates: The leader should enjoy the ability to talk actively and to arrange his ideas and to present them in a distinguished way, and treating the others with respect, politeness and courtesy, and the ability to comprehend the others.
3. Calmness and self-control: The leader has to control his nerves and to conduct in an unruffled way specially at the moment of making decisions and in front of the subordinates. He should be firm in implementing his decisions. Fahmi added as was mentioned in Abu-Hashem (2007) the ability of self-control is one of the conditions of mental health. The normal individual is the one who can control his desires and he should be able to satisfy and postpone fulfilling his needs, while (Gililand , 1989) considered these qualities as self-power which is added to the person.
4. Faith in the goals and purposes: The leader who does not believe in the goal and in what he wishes to achieve does not only frustrate himself, but rather he frustrates the resolution of his subordinates. For the leadership is not a rush or fluent speech or bravery or a skill, rather it is knowing the possibilities and exploiting them and putting every one of them in the place that suits him, and disseminating the idea of power and equality among them, distributing responsibilities among them and let them all participate in serving the public interest provided that every individual of them remains within his specialization.
5. Modesty: Much talking about the (I) is killing for the leader and it is a word which is not liked by the subordinates, because in it there is the feeling of haughtiness and superiority and it ascribes successes to the self only without respecting the feelings of others and magnifying the achievements. It suffices to know that one person cannot achieve and cannot realize all the successes.
6. Effectiveness: Implementing the decisions, following them up and removing the difficulties before them by the leader are indicators of his effectiveness and his interaction with the task. Also effectiveness in implementing difficult tasks is one of the biggest motives for the subordinates to work specially when the leader implants in them that there is no impossible thing in front of the powerful determination.
7. The good example: Without it the leader cannot enjoy the trust and respect of his followers, aides and subordinates. The noble goals cannot be achieved if the leader is not an example for his subordinates in the sublime and good actions.

Among the qualities is the good example. (Al-Musallah (the armed Magazine 14/3/2020) <http://www.almusallh.ly/ar/thought/40>, and it is represented in the ability to hear and listen very well and oral persuasion (Al-Qurni, 1426, Hijra).

Darweesh and Takla (1995) added other traits the most important of which are: fluency of speech and eloquence, power of affecting, strength of personality, zeal, dedication, calmness, not being emotional, military control and connecting, besides truth, honesty and justice.

1.2. Problem of the Study and Its Questions:

The skills of the training officers at Al-Istiqlal University in dealing with the students are considered among the topics which are worthy of interest and study. The researchers who work at Al-Istiqlal University in the academic domain and through their observation of the military training officers in how they deal with the University students,

it became prominent to them the importance of knowing to what degree the human and the self-skills are available in dealing with the University students. According to that, the questions of the study can be specified as follows:

1. To what extent are the human skills available among the officers of military and security training in dealing with students of Al-Istiqlal University from the viewpoint of the students themselves?
2. To what extent are the self-skills available among the officers of military and security training in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves?
3. Are there statistically significant differences at the significance level of ($\alpha \leq 0.05$) in the degree of the availability of the self and human skills among the training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves which are due to the variables of (gender, faculty, and level of the study year)?

1.3. Hypotheses of the Study:

1. There are no statistically significant differences at the significance level of ($\alpha \leq 0.05$) in the degree of the availability of the self and human skills among the training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves which are due to the variable of gender (male, female).

2. There are no statistically significant differences at the significance level of ($\alpha \leq 0.05$) in the degree of the availability of the self and human skills among the training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves which are due to the variable of faculty (humanities, law and police sciences, administrative sciences, medium community college).
3. There are no statistically significant differences at the significance level of ($\alpha \leq 0.05$) in the degree of the availability of the self and human skills among the training officers in dealing with the students of Al-Istiqlal
 - a. University from the viewpoint of the students themselves which are due to the variable of the study year level (first, second, third, fourth).
 - b.

1.4. Aims of the Study:

The study aimed to know the following:

1. Shedding the light on the extent of the availability of the human and self-skills which the training officers at Al-Istiqlal University for the security sciences have in dealing with the students.
2. Reinforcing the effect of each of the variables of gender, faculty and level of the study year on the extent of the availability of the human and self-skills which the training officers at Al-Istiqlal University for the security sciences have.
3. Providing the officials at Al-Istiqlal University with studied scientific results about the treatment of the training officers with the University students for the sake of improving the human and self-skills of the military training officers at Al-Istiqlal University.

1.5. Importance of the Study:

The importance of the present study is prominent from the responsibility which is entrusted to the military training officers and the nature of their work which depends on direct dealing with the University students every day. The importance of the study is represented in the following:

1. The Theoretical Importance: It is represented in enriching the scientific knowledge and providing the Arab library with what is useful in the domain of developing the skills of the treatment by the military training officers of the University students.
2. The Practical Importance: It is represented in that the study will contribute in making the military training officers and the officials at the University know how the military training officers deal with the University students and for the sake of planning practical programs for advancing the level of the skills which the officers should have in how to deal with the University students.

1.6. Limitations of the Study:

Place Limitation: This study was conducted at Al-Istiqlal University-Jericho, Palestine.

Time Limitation: This study was applied in the second study semester of the year 2019/2020.

Human Limitation: The students of Al-Istiqlal University for security sciences.

1.7. Procedural Definitions:

Skill: The ability to undertake a certain work in a way which is characterized by precision, ease and control in the effort and time which are exerted (Kan'aan, 2002).

Human Skills:

This means the ability of the leader to interact with his subordinates, coordinating their efforts and creating the spirit of group work among them.

Researchers procedurally define them as being the art of the military training officers' dealing with the students of Al-Istiqlal University concerning building good relations with them through taking interest in their inclinations, their feelings and accepting their suggestions and constructive criticisms. They are measured through the questionnaire which is prepared for measuring the availability of the skills (listening, talking and solving the problems).

Self-Skills:

They indicate to the group of the skills which are represented in performing the required tasks and works with ease and facility through training in practising the skill until it reaches the required mastery which in turn leads to personal and social congruence.

Researchers procedurally define it as being a group of personal traits, mental abilities and self-control which the military training officer should have in order to deal effectively with the others in specific situations in a way which achieves certain goals whether pertaining the person or the other persons.

Al-Istiqlal University: It is the Palestinian Academy for Security Sciences. It was established in (1998) as an institution which is specialized in rehabilitating and graduating scientific cadres have a high efficiency to supply the Palestinian security apparatuses with their needs for security, police and military specializations until it was accredited by the Palestinian Ministry of Higher Education.

2. Methods and Procedures:

2.1. Methodology of the Study:

The researchers in this study used the descriptive analytical methodology which depends on studying the phenomenon in the present time as it actually is. This is the suitable and best methodology for such studies.

2.2. Population of the Study:

The population of the study consisted of all the students of Al-Istiqlal University in the second study semester of the study year 2019/2020 A.D. whose number was (1459) male and female students. This is according to the statistical records of the Deanship of Admission and Registration at Al-Istiqlal University.

2.3. Sample of the Study:

The sample of the study consisted of (225) male and female students at Al-Istiqlal University from the students of the second study semester for the study year 2019/2020. Table (1) indicates the distribution of the study sample according to its variables.

Table (1) Distribution of the Study Sample According to Its Variables

Variable	Frequency	Percentage %
Gender		
Male	150	66.7%
Female	75	33.3%
Total	225	100%
Faculty		
Humanities	134	59.6%
Law and Police Sciences	44	19.6%
Administrative Sciences	36	16.0%
Medium Community College	11	4.9%
Total	225	100%
Level of Study Year		
First Year	29	12.9%
Second Year	42	18.7%
Third Year	62	27.6%
Fourth Year	92	40.9%
Total	225	100%

2.4. Tool of the Study:

The two researchers got acquainted with the theoretical literature and the previous studies which are related to the topic of the study. The researchers benefited from Al-Tanani (2010) study and Kurdieh (2011) study in building the items which are related to the skills of the military training officers in how to deal with the University students. The questionnaire of the study consisted of three sections which are:

The First Section: Personal data of the respondent (gender, faculty, level of the study year).

The Second Section: The axis of human skills and it consists of three domains which are: (listening, talking, and solving problems).

The Third Section: It concerns the axis of the self-skills which consists of three domains which are: (personal traits, mental abilities, self-control).

Table number (2) indicates the domains and axes of the questionnaire and the number of the items of every domain:

Table (2): Axes, Domains, and Number of the Questionnaire Items

Number of Axis	Domain	Number of Items
First Axis: Human Skills		
First Domain	Listening Skill	6
Second Domain	Communication Skill	6
Third Domain	Skill of Solving Problems	6
Sum of the items of the first axis		18
Second Axis: Self Skills		
First Domain	The domain of personal traits	5
Second Domain	The domain of mental abilities	5
Third Domain	The domain of self-control	5
Sum of the number of items of the second axis		15
Total sum of the questionnaire items		33

The researchers adopted the five—scale Lickert Measure to specify the extent of the availability of human skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves through responding to the measure. The following weights were adopted (very high degree=5, high degree=4, medium degree=3, low degree=2, very low degree=1).

Also the value of the categories of the graduated five-scale measure as follows:

1- 1.8 very low degree

1.81 -2.6 low degree

2.61 -3.4 medium degree

3.41 -4.2 high degree

4.21 -5 very high degree

2.5. Validity of the Instrument:

The questionnaire was presented to a group of specialized referees. They were asked to give their opinion concerning the items of the questionnaire in terms of their formulation, their linguistic preciseness and the extent of their suitability and belonging to the domain. This was either by agreement or modifying their formulation or omitting them because they are not important. The opinion of the majority was taken into account in the process of refereeing the items of the instrument, whereby the questionnaire in its final form became consisting of (33) items and for each item there are five alternatives.

2.6. Reliability of the Instrument:

The reliability coefficient was made for the items of the questionnaire by using the Cronbach Alpha Coefficient. Table (3) indicates the reliability coefficients for each domain and the total reliability coefficient:

Table (3): Reliability Coefficients

Number of Axis	the Domain	Reliability Coefficient
The First Axis: Human Skills		
The First Domain	Hearing Skill	0.895
The Second Domain	Listening Skill	0.789
The Third Domain	Skill of Solving Problems	0.859
Total Reliability Coefficient for the First Axis		0.934
The Second Axis: Self-Skills		
The First Domain	Domain of Personal Traits	0.814
The Second Domain	Domain of Mental Abilities	0.878
The Third Domain	Domain of Self Control	0.856
Total Reliability Coefficient for the Second Axis		0.935
Total Reliability Coefficient for All of the Items of the Questionnaire		0.962

It is noticed from Table (3) that the reliability coefficient for each of the domains was suitable, and that the total reliability coefficient came with a high degree (0.96). These values of the reliability coefficient are considered high values which allow the application of the instrument.

2.7. Variables of the Study:

The study included the following variables:

A- The Independent Variables:

Gender: It has two levels (male, female)

Faculty: It has four levels (humanities, law and police sciences, administrative sciences, medium community college)

Level of study year: It has four levels (first year, second year, third year, fourth year)

B- The Dependent Variable:

The degree of the responses of the individuals of the sample on the instrument of the study related to the extent of the availability of human skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves.

2.8. Statistical Treatments:

In order to statistically treat the data, the Statistical Packages for the Social Sciences (SPSS) computerized program was used. This was by using the following descriptive and analytical statistical treatments:

-Arithmetic means and standard deviations.

-The T-test for the independent operations.

-One Way ANOVA.

-The Less Statistical Significant (LSD) test for the dimensional comparisons.

3. Presenting Results

Results related to the first question of the study the text of which is: What is the extent of the availability of human skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves?

To answer the question, the arithmetic means and the standard deviations were calculated for the extent of the availability of human skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves for all of the domains of the human skills axis.

Tables from (4)—(7) indicate these results.

First: The Domain of the Hearing Skill

Table (4): Arithmetic Means and Standard Deviations of the items of the first domain related to the hearing skill among the military training officers

Item Number	Item	Arithmetic Mean	Standard Deviation	Estimation Degree
1.	Military training officers listen To the students without interruption	2.83	1.18	Medium
2.	Military training officers concentrate Their interest on what the student says	2.67	1.11	Medium
3.	Military training officers are interested In the student's feelings and conversations	2.51	1.13	Low
4.	Military training officers encourage students To express their ideas	2.98	1.20	Medium
5.	Military training officers have the ability to Comprehend and understand what is said	3.24	1.12	Medium
6.	Military training officers make the students Feel that they recognize what the student says	3.10	1.15	Medium
Total Degree		2.89	0.93	Medium

The results mentioned in Table (4) indicate that the total degree of the extent of the availability of human skills among military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves for the domain of listening has achieved a medium level with an arithmetic mean of (2.89).

Item (5) the text of which is (military training officers have the ability to comprehend and understand what is said) has got the highest arithmetic mean which is (3.24) which is a medium degree, whereas item number (3) the text of which is (military training officers are interested in the student's feelings and conversations) attained less than a medium which is (2.51) which is a medium degree.

The researchers interpret this result in that military officers due to their varying experiences in the field have a big ability to listen to others, to understand the details of their suffering or their complaint or their daily demands, or for the sake of gathering information related to the nature of work from the students. This one of the alphabets of military work which imposes upon them continuous communication with the different military regiments to deal with what is new in successive issues based on a strict military ranking system which graduates from the base of the pyramid to its summit. This is what was reflected by the responses of the individuals of the sample in a medium degree. This result agrees with the study of (Martin & Others, 2010) while it differed from Al-Tanani (2010) study and Al-Thuwaiby (2005) study whereby the listening skill in the two studies was big.

Second: The Domain of the Speaking Skill

Table (5): The Arithmetic Means and the Standard Deviations of the Items of the Second Domain Which is Related to the Speaking Skill among Military Training Officers

					Item number
Item	Arithmetic	Standard	Estimation		
			Mean	Deviation	Degree
7. Military training officers do not find difficulty in talking to the students	3.40	1.10		Medium	
8. Military training officers do not find Difficulty in praising and being courteous to others			2.87	1.19	Medium
9. Military training officers select clear words To express their thoughts			3.16	1.22	Medium
10. The students listen to military training			3.84	1.18	High

Officers when they talk

11. Military training officers enjoy self-confidence 3.71 1.09 High

When they talk to the students

12. Military training officers talk to the students 3.42 1.13 High

In a style which enables them to comprehend what they say

Total Degree	3.41	0.81	High
--------------	------	------	------

The results mentioned in Table (5) indicate that the total degree of the extent of the availability of human skills among military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves for the domain of the speaking skill has achieved a high level and with an arithmetic mean of (3.41). Item (10) the text of which is (the students listen to the military training officers when they talk) got the highest arithmetic mean which is (3.84) and it is a high degree, whereas item number (8) the text of which is (military training officers do not find difficulty in praising and being courteous to others) obtained the least medium which is (2.87) and this is a medium degree.

The researchers interpret this result in that the students of Al-Istiqlal University recognize the extent of the importance of talking and daily communication with their leaders and their trainers, through official channels which are agreed upon in the international military formations and academies, in several methods including: oral and written communiques and the orders.... etc. This is what their responses to the instrument of the study reflected with a high degree.

The researchers also ascribe the result to the fact that the nature of the job of the military officers is characterized by giving military instructions and orders to the students whereby there is a sort of severity in these orders when talking. Thus the students of the University view that military training officers have high confidence in themselves when they talk to the students and they do not find difficulty in talking to the students.

This result differs from Al-Tanani (2010) study whereby it showed that the degree of the talking skill among police officers for dealing with the public was medium.

Third: The Domain of Problem Solving Skill

Table (6): Arithmetic Means and Standard Deviations for the Items of the Third Domain Which Is Related to the Problem Solving Skill among Military Training Officers

Item Number	Item	Arithmetic Mean	Standard Deviation	Estimation Degree
13.	Military training officers use The law to solve problems among students	3.27	1.18	Medium
14.	Military training officers possess a suitable Background about the legal systems and rules related to their work	3.59	1.12	High
15.	Military training officers combine between Firmness and leniency in solving the problems of the students	3.29	1.19	Medium
16.	Military training officers have the ability To lessen the causes of the occurrence of problems Among the students	3.48	1.10	High
17.	Military training officers seek the help of those Who are higher in rank than them in solving the problems? Which face the students	3.34	1.17	Medium
18.	Military training officers present evidence And proofs when solving the problems of the students	3.23	1.13	Medium
Total Degree		3.37	0.88	Medium

The results mentioned in Table (6) indicate that the total degree of the extent of the availability of human skills among military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves has achieved a medium level

with an arithmetic mean of (3.37). Item (14) the text of which is (military training officers possess a suitable background on the legal systems and rules which are related to their work) obtained the highest arithmetic mean which is (3.59) and it is a high degree. Item number (18) the text of which is (military training officers present evidence and proofs when solving the problems of the students) obtained the least medium which is (3.23) which is a medium degree.

The researchers ascribe this result to the students' recognition of their reality of their daily life which is lived at Al-Istiqlal University, and their direct communication with their trainers to find effective and positive solutions to the different problems and obstacles which face them, and which their military life is not devoid of, and the reality of their daily training, specially that these problems are many and varied, some of them require urgent solutions and others required deferred solutions. This is what their responses to the instrument of the study revealed in a medium total degree. This result agreed with the study of (Matin & Others, 2010) and the study of (Al-Tanani, 2010).

Fourth: The Total Domain of the Human Skills Axis

Table (7): The Arithmetic Means and the Standard Deviations for the Items of the First Axis Related to Human Skills among the Military Training Officers

Number	Domain	Arithmetic Mean	Standard Deviation	Estimation Degree
1.	Domain of Listening Skill	2.89	0.93	Medium
2.	Domain of Speaking Skill	3.41	0.81	High
3.	Domain of Problem Solving Skill	3.37	0.88	Medium
4.	Total Domain for the Axis Of Human Skills	3.22	0.79	Medium

The results mentioned in Table (7) indicate that the degree of the total domain for the degree of the axis of the availability of human skills among military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves has achieved a medium level with an arithmetic mean of (3.22).

The domain of the availability of the speaking skill came in the first rank with an arithmetic mean of (3.41) and it is high. The domain of the listening skill came in the last rank with an arithmetic mean of (2.89) and it is medium.

The researchers interpret the responses of the students of Al-Istiqlal University on the degree to which the military officers possess the human skills (listening, speaking, problem solving) in dealing with them in a medium degree, in that they (human skills) are considered among the factors of the success of the University, achieving its vision and its goals by graduating a distinguished officer who is endowed with all the positive human skills which qualify him to deal with the public, to serve his homeland and his country people following the example of and emulating his trainers. These skills are also considered an essential element of the elements of success and distinction in the public life and in the security work in particular.

Results related to the second question of the study, the text of which is: What is the extent of the availability of the self-skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves?

To answer this question, the arithmetic means and standard deviations were calculated for the extent of the availability of the self-skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves for all of the domains of the axis of the human skills.

Tables from (8) — (11) indicate these results.

First: The Domain of the Personal Traits Skill

Table (8): Arithmetic Means and Standard Deviations for the Items of the First Domain Related to the Skill of Personal Traits among Military Training Officers

Item Number	Item	Arithmetic Mean	Standard Deviation	Estimation Degree
1.	Military training officers enjoy Fitness and good bodily strength	3.09	1.28	Medium
2.	Military training officers are Characterized by activity and vitality	3.14	1.21	Medium

3. Military training officers are interested In the outside appearance	4.11	0.93	High
4. Military training officers have the ability To control the use of the nervous energy	2.98	1.14	Medium
5. Military training officers have the ability To endure arduous effort in completing the work	3.53	1.04	High
Total Degree	3.37	0.85	Medium

The results mentioned in Table (8) indicate that the total degree for the extent of the availability of the self-skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves for the domain of the personal traits skill has achieved a medium level, with an arithmetic mean of (3.37). Item (3) the text of which is (military training officers are interested in the outside appearance) has got the highest arithmetic mean which is (4.11) and it is a high degree. Item number (4) the text of which is (military training officers have the ability to control the nervous energy obtain the least medium which is (2.98) and it is a medium degree.

The researchers ascribe this result to the fact that there is big interest by those who are responsible for military training officers that the military training officer be qualified whereby he is integrated in sessions to build his bodily capacities and maintain them continuously before he is selected for work in the domain of training at Al-Istiqlal University.

The researchers also ascribe this result to the degree of Al-Istiqlal University students' familiarity and knowledge of the personal qualities and traits which the officer should be endowed with so that he becomes a successful and influential officer who performs his role which is entrusted to him in the perfect way. In addition, the scientific qualification of the students the security, military and police domains made them acquire specialized knowledge of on a group of formal (appearance) and essential personal traits which should be found in the officer in addition to developing and reinforcing them periodically by several training and activating methods.

Third: The Domain of Mental Abilities

Table (9): The Arithmetic Means and the Standard Deviations of the Items of the First Domain Related to the Skills of Mental Abilities by the Military Training Officers

Item number	Item	Arithmetic Mean	Standard Deviation	Estimation Degree
6.	Military training officers enjoy quickness Of intuition in dealing with emergent situations	3.36	1.15	Medium
7.	Military training officers have the mental Flexibility to accept good suggestions	3.30	1.09	Medium
8.	Military training officers enjoy a wide Imagination which is capable of visioning and imagining for all the probabilities	3.22	1.05	Medium
9.	Military training officers have the ability To observe the fine details of the problem	3.17	1.12	Medium
10.	Military training officers have the mental Readiness for analysis and conclusion from the Available data and information	3.33	1.07	Medium
Total Degree		3.27	0.90	Medium

The results mentioned in table (9) indicate that the total degree for the extent of the availability of the self-skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves has achieved a medium level, with an arithmetic mean of (3.27). Item (6) the text of which is (military training officers enjoy quickness of intuition in dealing with emergent situation) has obtained the highest arithmetic mean which is (3.36) and it is a medium degree, whereas Item number (9) the text of which is (military training officers have the ability to observe the fine details of the problem) has obtained the least medium which is (3.17) which is a medium degree.

Researchers interpret this result by the fact that the students of Al-Istiqlal University recognize that security, military and police work requires distinguished mental abilities for success and distinction, in addition to specialized abilities in different security domains, for example: training, analysis, search, investigating, enlisting, security sense....etc.

All of which are skills which require special mental and rational abilities, and in them the officers differ in the extent of their success in their work.

Accordingly, the students of Al-Istiqlal University view that these skills are realized in the military officers (the trained ones) with a medium degree. This is what they reflected through their quickness of intuition in dealing with emergent situations, and the ability to analyse and to conclude and many others. This result agrees with Al-Tanani (2010) study whereas it differed from Al-Qurni (2005) study.

Third: The Domain of Self-Control

Table (10): Arithmetic Means and Standards Deviations for the Items of the First Domain Related to the Mental Abilities of the Military Training Officers

Item	Arithmetic	Standard	Estimtion	Number
				Degree
11. Military training officers		3.12	1.15	Medium
Have the ability to keep calm during difficult situations				
12. Military training officers		3.13	1.20	Medium
Have the ability to control emotions resulting from personal problems				
13. Military training officers		2.69	1.16	Medium
Have the ability to accept others' criticisms without anger				
14. Military training officers have		3.28	1.09	Medium
The ability to control their emotions and directing them				
Towards accomplishing the work				
15. Military training officers have		2.85	1.17	Medium
The ability to avoid making decisions while they are in a bad mood				
Total Degree		3.02	0.92	Medium

The results mentioned in Table (10) indicate that the total degree for the extent of the availability of self-skills among the military training officers in dealing with the students of Al-

Istiqal University from the viewpoint of the students themselves for the domain of the skill of self-control has achieved a medium level with an arithmetic mean of (3.02). Item (14) the text of which is (military training officers have the ability to control their emotions and direct them towards accomplishing the work) has obtained the highest arithmetic mean which is (3.28) which is a medium degree, whereas item number (13) the text of which is (military training officers have the ability to accept others' criticisms without anger) has obtained the least medium which is (2.69) which is a medium degree.

Researchers interpret this result by the fact that the University students know the importance of all the workers in the military or security or training field being unruffled and self-controlled because this has an extreme importance in taking the right decisions and not being rash or drawn to current emotions and reactions specially that the emergencies of this work are many and various. The medium of their responses on the military training officers being endowed with self-control was at a medium degree.

It is mentioned that the officer's possession of the skill of self-control and the ability to govern and control is one of the criteria of success and which defines the way of his interaction with the different situations.

Fourth: The Total Domain of the Self-Skills Axis

Table (11): The Arithmetic Means and Standard Deviations for the Domains of the Second Axis Related to Self-Skills among Military Training Officers

Domain	Arithmetic	Standard	Estimation	Number	
				Mean	Deviation Degree
1. The domain of personal traits	3.37	0.85			Medium
2. The domain of mental abilities	3.27	0.90			Medium
3. The domain of self-control	3.02	0.92			Medium
4. The Total Domain of the Self-Skills Axis	3.22	0.81			Medium

The results mentioned in table (11) indicate that the degree of the total domain for the degree of the self-skills axis among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves has achieved a medium level with an arithmetic mean of (3.22).

The domain of the availability of personal traits came in the first rank with an arithmetic mean of (3.37) which is a medium degree, and it was followed in the second rank by the domain of the mental abilities with a medium of (3.27) which is a medium degree. The domain of the skill of self-control came in the last rank with an arithmetic mean of (3.02) which is a medium degree.

Researchers ascribe this result and its revolving around the medium degree to the fact that the human personality is one unit which is in harmony in itself and its entity. This is manifested in its social, human, self and mental sides. Also that is considered one of the sides of the sound balanced personality in which one side does not dominate another side, but rather it lives in internal peace and self-tranquillity which are positively reflected in the life conduct in general and in the security and training conduct in particular.

It is worth mentioning that positive personal traits, the unique and distinguished mental abilities, the skill of self-control and emotional control are like standard and criteria on which the success of the individual depends in the different security domains specially the training domains.

The results related to the third question of the study the yest of which is: Are there statistically significant differences at the significance level of ($\alpha=0.05$) in the degree of the availability of human and self-skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves which are due to the variables of (gender, faculty, level of the study year)?

To answer this question, the following hypotheses of the study were examined:

The first hypothesis of the study the text of which is: There are no statistically significant differences at the significance level of ($\alpha \leq 0.05$) in the degree of the availability of the self and human skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves which are due to the variable of gender (male, female).

To examine the hypothesis, the researcher used the T-test for two independent groups (Independent t-test), and the results of Table (12) indicate this

Table (12): Results of the t-test for two independent groups to test the significance of the differences according to the variable of gender.

Axis	Males (n=150)		Females (n=75)	
	Arithmetic Mean	S D	Arithmetic Mean	SD
Human Skills	3.2744	0.74314	3.1044	0.86501
Self-Skills	3.2711	0.75826	3.1173	0.91118
Total Degree	3.2729	0.71428	3.1103	0.84663
a value	Significance Level*			
	1.455	0.148		
	1.260	0.210		
	1.429	0.156		

* Statistically significant at the significance level of ($\alpha \leq 0.05$), freedom degrees (223), and the tabular value of (t) (1.96).

It is clear from the results of Table (120) that there are no statistically significant differences at the significance level of ($\alpha=0.05$) in the first and second domains and the domain of the degree of the availability of the self and human skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves which are due to the variable of gender (male, female).

Researchers ascribe this result to the fact that all the students of Al-Istiqlal University recognize in an approximate and equal way the self and human skills which their officer's trainers have.

This reflects their (the trainers) adoption of methods of training and unified dealing with all the students of the University including the males and the females in addition to the unity of instructions and trainings which they receive.

This is reflected in their responses to the instrument of the study without considering the gender of the student. Also the scientific rehabilitation to which all the students are subjected is the same which means their implicit agreement on the most important self and human skills which the officers or the leaders should be endowed with.

The Second Hypothesis of the Study the Text of Which is: There are no statistically significant differences at the significance level of ($\alpha=0.05$) in the degree of the availability of the self and human skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves which are due to the variable of the faculty (Humanities, Law and Police Sciences, Administrative Sciences, Medium Community College).

In order to test this hypothesis, the researchers used the One Way ANOVA. The results of Table (13) indicate this.

Table (13): Results of the One Way ANOVA for Testing the Significance of the Differences According to the Variable of the Faculty

Domain	Sources of Variance	Sum of Squares	Degrees of Freedom
Axis of	among groups	3.594	3
Human Skills	through Groups	135.506	221
Total		139.100	
Axis of	Among Groups	5.431	224
Self-Skills	Through Groups	142.858	646
Total		148.289	
Total degree	Among Groups	4.098	3
	Through Groups	128.286	221
Total Degree		130.384	224
Table (13) Continued			
Value of F	Significance Level		

1.954	0.122
2.801	0.041*
2.390	0.070

* Statistically significant at the significance level of ($\alpha \leq 0.05$)

It is clear from the results of Table (13) that there are no statistically significant differences at the significance level of ($\alpha \leq 0.05$) in the degree of the availability of the self and human skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves which are due to the variable of the faculty in the first domain which is related to the axis of the human skills and the total degree, whereas there were statistically significant differences at the significance level of ($\alpha \leq 0.05$) in the axis of the self-skills. To know in favour of which are these differences, the two researchers used the (LSD) test. Table (14) clarifies the results of this test.

Table (14): Results of Using the LSD Test (less statistical Significance) For Dimensional Comparison between the Mediums of the Faculty Categories in the Self-Skills Axis

Axis	Faculty	Humanities	Law	Administrative	Community
		Police Sciences	Sciences	College	
Self-Skills	Humanities	.11355	-	.02181	-.66676*
Axis	Law and Police		-.13535	-.78030*	
	Sciences				
	Administrative Sciences			-.78030*	
	Community College				

It is indicated from Table (14) that there are statistically significant differences in the degree of the availability of the self and human skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves which are due to the variable of the faculty and in favour of the Medium Community College over the Faculty of Humanities and the Faculty of Administrative Sciences.

The two researchers ascribe this result to the fact that all the University students from the Bachelor's level receive similar training throughout the four years (the study period to obtain the Bachelor's degree). This was reflected in their arithmetic means in the tables which were previously mentioned, in contrast with the Diploma students who are subjected to an intensive training program which extends to two years (the study period to obtain the Diploma degree). Concentration is on their different personal traits and the skills of the mental abilities besides the skill of self-control and governing and controlling themselves. This reflected their responses on them in a clearer way than what they are among the Bachelor's students whereby the differences were in their favour.

The third hypothesis of the study the text of which is: There are no statistically significant differences at the significance level of ($\alpha=0.05$) in the degree of the availability of the self and human skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves which are due to the variable of the level of the study year (First, Second, Third, Fourth).

In order to test this hypothesis, the researcher used the One-Way ANOVA test. The results of Table (15) indicate this

Table (15): Results of the One-Way ANOVA test for testing the differences according to the variable of the level of study year

Domain	Source of Variance	Sum of Squares	Degrees of Freedom
Human Skills	among Groups	11.144	3
	through Groups	127.956	221
	Total	139.100	224
Self-Skills	Among Groups	10.417	3
	through Groups	137.872	221
	Total	148.289	224
Total Degree	among Groups	10.785	3
	Through Groups	119.599	221

Total	130.384	224
Table (15) Continued		
Medium of Squares	F Value	Significance Level
3.715	6.416	*.001
.579		
3.472	5.566	*.001
.624		
3.595	6.643	*.001

* Statistically significant at the significance level of ($\alpha \leq 0.05$)

It is clear from Table (15) that there are statistically significant differences at the significance level of ($\alpha \leq 0.05$) in the degree of the availability of the self and human skills among the military training officers in dealing with the students of Al-Istiqlal University from the viewpoint of the students themselves which are due to the variable of the faculty in the first domain which is related to the axis of the human and life skills and the second domain which is related to the self-skills and the total degree. To know in favour of whom these differences are, the researchers used the (LSD) test. Table (16) clarifies the results of this test.

Table (16): Results of Using the (LSD) test (Less Statistical Difference) for Dimensional Comparison between the Mediums of the Categories of the Study Year Level in the Axes of the Study

Axis	Level of Study Year	First	Second	Third	Fourth
Axis of Skills	First		.26601	.69151*	.50100*
	Second			.42550*	.23499
	Third				-1.9051
	Fourth				
Axis of Self					
Skills	First		.18522	.64283*	.44568*
	Second			.45760*	.26046

	Third			
	Fourth			
Total Degree	First	.22929	.66938*	.47585*
	Second		.44009*	.24657
	Third			-.19353
	Fourth			

It is indicated from the results of Table (16) that the differences were in all the axes of the study and the total axis was in favour of the First year over the Third year and the Fourth year and in favour of the Second year over the Third year.

Researchers ascribe this result to the fact that the students' being new in the University and specifically in their First year positively affects their degree of commitment and abidance with the University regulations and instructions and the degree of their compliance with the orders and prohibitions which are issued by the different specialized sources at the University as compared with the students of the following years. It is worth mentioning that the difference which is intended here is a difference in the degree of commitment and not in its absence.

The researchers also attribute this to the shock of the first experience of the military life of the students away from their civilian life and its flexibility and their application of the military instructions and laws in a strict way at the onset of their university life. This was reflected in their responses concerning the existence of the human and self-skills among the trainers according to their study year from the First year till the Fourth year.

4. Recommendations

In the light of the results brought about by the study, the researchers recommended the following:

- Reinforcing the human skills of the trainers specially the two skills of listening and problem solving.
- Reinforcing the self-skills of the trainers specially the personal traits, the mental abilities and self-control.

- Providing the students with more security and academic trainings which develop in them these skills so that they become future leaders who are successful in the domains of work which are entrusted to them after their graduation.
- Conducting future studies in the same domain so that they deal with other important variables on the training process, such as: the different training methods, the social skills, personality patterns among the trainers, methods of treatment.....etc. and this is in order to tighten the ring on the best possible training systems.

6. References

6.1. Arabic References

- ‘Uthman, Farouq. (1997). The Strategies of Building the Behavioural Skills for the Administrative Leaders. Cairo: Dar Al-Ma’aarif.
- Abu-Hashe, Asa’ad. (2007). The Effectiveness of Training On Self-Control in Lowering the Aggressive Behaviour Among a Sample of Juveniles at The Social Observation House. (Unpublished M.A. thesis). Jordan, Mu’ta University.
- Al-Jayyousi, Muhammad and Jadallah, Jameela (2000). Administration: Science and Application. Amman: Dar Al-Maseera for Publishing and Distribution.
- Al-Qurni, Muhammad Bin Muhsin (2007). The Attitudes of the Officers towards the Leadership Traits and Skills: An Applied Study on the Officers of the General Directorate of the Civil Defence in the Kingdom of Saudi Arabic. Unpublished M.A. thesis. Nayef’s University for Security Sciences, Al-Riyadh, Saudi Arabia.
- Al-Qurni, Muhammad. (1426 Hijra). The Attitudes of the Officers towards the Leadership Traits and Skills: An Applied Study on the Officers of the General Directorate of the Civil Defence in the Kingdom of Saudi Arabia. (Unpublished M.A.thesis). Al-Riyadh, Nayef’s Arab University for Security Sciences.
- Al-Tajem, Abdul-Ghani and Al-Sawwat, Talq. (199%). The Organizational Behaviour: The Concepts, The Theories, The Applications, 3rd ed. Damascus: The Directorate of University Textbooks.
- Al-Tanani, Rami ‘Umar (2010). The Skills of the Policeman in Dealing With the Public and Their Effect on the Efficiency of Providing Security Service:An Applied Study on the

Policemen Working in the Gaza Governorate. Unpublished M.A. thesis. The Islamic University, Gaza, Palestine.

- Al-Thuwaibi, Fahd Bin Muhammad (2005). The Administrative and Personal Skills and Their Relationship with the Public; A Survey Study on the Officers Working in the Police Force of Al-Qaseem Area. Unpublished M.A. thesis. Nayef's University for Security Sciences. Al-Riyadh, Saudi Arabia.
- Al-Waheebi, Khaled. (2005). The Role of Leadership Rehabilitation Programs in Developing the Security Leadership Skills. (Unpublished M.A. thesis). Al-Riyadh, Nayef's Arab University for Security Sciences.
- Darweesh, Abdul-Kareem and Takla, Layla. (1995). Fundamentals of Public Administration. Cairo: The Anglo-Egyptian Press.
- Darweesh, Ibraheem. (1988). Al-Waseet (Intermediary) in Public Administration. Cairo: Egyptian General Commission of Writers.
- Dosh, Bander Ali (2006). The Role of Security Skills in Raising the Performance Level: A Survey Study of the Directors of the Holy Capital Police Stations. Al-Riyadh. Unpublished M.A. thesis. Nayef's University for Security Sciences. Al-Riyadh, Saudi Arabia.
- Hameed, Muhammad and Al-Ma'aaz, Muhammad. (1986). Public Administration Between Theory and Application. Cairo: Faculty of Commerce.
- Kan'aan, Nawaa' (1985). The Administrative Leadership, 3rd ed. Al-Riyadh: Al-Farazdaq Presses.
- Kurdieh, Ayman Zaki (2011). The Skills of the Health Cadre in Dealing with the Public and Their Effect on the Efficiency of the Health Service from the Viewpoint of the Public of the Revising Patients. Unpublished M.A. thesis. The Islamic University, Gaza, Palestine.
- Shareef, 'Ali (1987). Managing the Public Organizations. Alexandria: The University House for Publishing and Distribution.
- Sheeha, Ibraheem. (1983). Public Administration. Beirut: The University House for Printing and Publication.

6.2. English References

- Fletcher, J.D. & Chatelier, P.R. (2000). An overview of Military Training. Institute for the Defence Analyses, Virginia, United States.
- Gilliland. (1989). Theories and Strategies in Counselling Psychotherapy. Prentice Hall Englewood Cliffs, New Jersey.

- Matin, Hassan Z. Jandaghi , Golamreza, Haj Karimi, Fatime, Hamidzadeh, ‘Ali (2010). Relationship between Interpersonal Communication Skills and Organizational Commitment: Case Study: Jahad Keshavarzi University of Qom, Iran. European Journal of Sciences, Volume 13, Number 3.

6.3. Electronic References

- Military Training Commission-Palestine. 14/3/2020 <http://www.gmtc.ps>
- The Sultan Qabous Academy for Police Sciences 14/3/2020. <http://sqaps.edu.om/?p=3442>
- Al-Musallah Magazine. 14/3/2020. <http://www.almusallh.ly/ar/thoughts/40-vol-3>

Copyright © 2021 Dr. Amer Saber Shehadeh, Dr. Mohammad Taleb Dabous, Dr. Nader Taleb Shwamreh, AJRSP. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY NC).

Doi: doi.org/10.52132/Ajrsp.e.2021.305

Afghan Undergraduate Students' Perceptions towards Effective Teaching

Faridullah Farid

Pashto Department, Faculty of Languages and Literature, Shaikh Zayed University, Khost,
Afghanistan

Mirza Khan Nikzoy

Pashto Department, Faculty of Languages and Literature, Shaikh Zayed University, Khost,
Afghanistan

Wali Khan Monib*

English Department, Faculty of Languages and Literature, Shaikh Zayed University, Khost,
Afghanistan.

*E-mail: walikhan.af@gamil.com

Abstract:

The aim of this article is to explore Afghan undergraduate students' perceptions towards effective teaching at a public university. Data were collected based on a Likert scale questionnaire containing 32 items from 47 respondents. The results show that although the ability of teachers to teach and help students are vital, their attitudes towards students are considered crucial for judging their effectiveness. Most of the students perceived that a teacher who has excellent knowledge of the subject, well prepared, value students' opinions and contribution, start sessions on time, provide both group activities and assessment briefs considered very effective. The article concludes by suggesting that notions of effectiveness are predicated less on university teachers having high academic expectations and more on the provision of a supportive environment in which teachers scaffold learning effectively and promote effective interaction with their students.

Keywords: Afghan Undergraduate Students, Perception, Effective Teaching

1. Introduction

In the past, traditional teaching and learning methods were used at the universities of Afghanistan. Lecturers were relying on frontal teaching or lecturing where students would passively listen to them in the classroom. For instance, lecturers were just presenting what they have already prepared related to the topic and students would take notes without proper interaction with the lecturers. However, some innovations and changes began in the early 21st century because many lecturers acquainted with technology, especially the use of computers, in the educational system. Although different teaching methods were used, the dominant one was teacher-centered. The lecture-based method is still in use with minor adaptation by infusing technology. If we want to create an active learning environment, it is important to use student-centered methods. Facilitating students learning, we should give more chances to students to participate in lessons. Those instructional methods which are already proved to be effective in teaching and learning such as student-centered have to be applied. Several educational studies found an important relationship between student attitudes to the evaluation of the effectiveness of instruction and the success of a system for teaching assessment. However, to the best of the researchers' knowledge, less research has been conducted in the context of Afghanistan investigating effective teaching from undergraduate students' perspectives. Hence, the aim of this study is to investigate the perceptions of Afghan undergraduate students towards effective teaching.

1.1. Research Questions

- a) What are the perceptions of Afghan undergraduate students towards effective teaching?
- b) What are the qualities of teachers that students perceive to promote their learning?

2. Literature Review

Generally speaking, research regarding teaching have focused on different aspects and themes which include method and technique (e.g., Galbraith, 2004; Svinicki & McKeachie, 2010; Davis, 2009), supporting and caring for students' learning (e.g., Kasworm, 2008), the meaning of learning for students (e.g., Weimer, 2002), human emotion and learning relationships (e.g., Kasworm, 2008). According to Hyland (2010), learning involves "the development of knowledge, values, emotions, understanding, reason, skill, experience and insight" (p.525), involving both knowledge acquisition and guidance of students on how learning can be appropriate to their lives,

How it applies to their roles and how it is relevant to their life experiences (Hooks, 1994; Kanuka, 2010; Kasworm, 2008). Vella (2002) articulated the importance of creating a relationship between teachers and learners that involves respect, safety, open communication, affirmation, listening, and humility. Specifically, classroom safety involves trust in the knowledge and competency of the instructor; trust in the design of the course including the sequencing of activities, feasibility and relevance of course objectives, and maintenance of a non-judgmental environment. In addition, Schoeberlein (2009) advocated for the use of silence, mindful listening, humility, and presence. Teachers can nourish students' inner lives and encourage them to create their learning rather than simply filling them with the teacher's knowledge. That is why "Effective teaching" is indeed hard to define. It is often portrayed in literature and academic settings that effective teaching practices are clearly important for raising student achievement, and characteristics of the same are rather mysterious. The reality is that there is no single factor, nor consensus in the literature, about what is, or what are the components of effective teaching (Hande, 2014). Rather than anyone teacher behavior is strongly related to achievement, effective teaching is not being able to do a small number of 'big' things right but is rather doing a large number of 'little' things well (Reynolds, 2011). Generally, researchers identify three main types of teacher knowledge: teachers' subject knowledge (what they know about the subject they are teaching), teachers' pedagogical knowledge (what they know about effective teaching), and teachers' pedagogical subject knowledge (what they know about the effective teaching of their specific subject) (Reynolds, 2011). Given the contingent and constructive nature of what counts as effective teaching, the ways in which effectiveness is measured will have a direct impact on the potential of any reform policy to positively influence the overall effectiveness of a teaching force and therefore the achievement of its students. Therefore, it is suggested to encourage local adaptations of global policies for encouraging and measuring effective teaching (Gabriel & Richard, 2015).

On the other hand, though schools cannot and should not take responsibility for the influence of student health, housing, poverty, and family status (Ravitch, 2010), there are countless examples of effective teachers leading students to overcome such odds in terms of their academic achievement. Therefore, it is written from the perspective that teacher effectiveness is a key lever in the improvement of educational opportunities for all students, especially those at socioeconomic risk. However, there are no static or universal definitions for effective teaching as stated earlier.

What counts as effective is in part determined by the tools selected to measure it, and in part by local values about the goals of education (Anderson, 1991). In the case of teaching and learning, how we choose to represent teaching within definitions of effectiveness and evaluation criteria alters how teaching is interpreted and understood. As Anderson (1991) cautions, teachers' effectiveness is predicated on their ability to consistently reach the implicit and explicit goals set both by them and for them by others. It is, therefore, possible that a teacher is effective in terms of some, but not all of the metrics they are held accountable for. This method also assumes that there are universals of effective teachers that can be applied and made visible across settings. Hence, this study aims to investigate the perceptions of Afghan undergraduate students towards effective teaching.

3. Methodology

3.1. Research Design

The overall strategy used to carry out research that outlines a clear and logical plan to handle established research question(s) through data collection, interpretation, analysis, and discussion is referred to as research design. The current research study is based on a quantitative approach whereby a survey design is used to investigate the perceptions of Afghan undergraduate students on the proposed questions related to effective teaching. Survey research designs are techniques in which a researcher distributes a questionnaire to the entire population or a sample of participants to describe the "behaviors, opinions, attitudes, beliefs, characteristics, perceptions and their experiences" about current issues (e.g., Creswell, 2012; Neuman, 2014). According to Creswell (2012), an issue is found by the researcher when performing quantitative analysis "based on field patterns or the need to clarify why anything happens." In addition, working with and gathering organized and numerical data, or data that can be numerically interpreted is a part of quantitative analysis methods (Tracy, 2013). Gathering factual information, surveys are useful and relatively easy to access students and teachers (Cohen, Manion & Morrison, 2013). Other reasons for its prevalence are "practicality and cost-effectiveness" (Mathers, Fox & Hunn, 2007).

3.2. Participants

The research involved undergraduate students of the Languages and Literature Faculty from Shaikh Zayed University. During the data collection process, the researchers sent a consent form to the participants along with the questionnaire. They were selected based on stratified sampling. Stratified sampling is a sampling method that divides a population into sub-groups called strata

based on similar characteristics shared by their members (Sharma, 2017). Hence, the population was divided into strata based on the supplementary data. Secondly,

the sampling frame was divided by the strata and then the respondents were drawn through random sampling from each stratum. Both active and graduate students' perspectives were asked on effective teaching. In this regard, a total of 47 students were able to complete and return the questionnaires.

3.3. Research Instrument

To collect data for this research study, a survey instrument was adopted on effective teaching from Allan, Clarke, and Jopling (2009). Typically, teaching effectiveness is measured through some forms of student questionnaires that have been specifically designed to measure observed teaching styles or behaviors (Wright & O'Neil, 1992). The instrument is concerned with the perceptions of students regarding effective teaching. The instrument measured on a five-point Likert scale was given to the respondents where they could demonstrate strong disagreement (1), disagreement (2), neutrality (3), agreement (4), or strong agreement (5) in response to each of the statements.

3.4. Background of the Respondents

Information required for this part is gender and academic qualifications of the respondents including freshman, sophomore, junior or senior; degree pursuing. Table 1. Since the chosen public university where the survey was conducted does not have any master or Ph.D. programs in the related field, only bachelor students were involved. The numbers of males were 45 (95.7%) making a large proportion while females made 2 (4.3%) of teachers as participants. There were 14 (29.8%) freshman, 3 (6.4%) sophomore, 15 (31.9%) junior and 11(23.4%) senior. Of these, the majority 34 (72.34) were 25-30 years old, 13 (27.66%) were 31-35 years old and no one (0%) were more than 35 years old.

Table 1. 1 Demography of the respondents

Demographic Variables			Frequency	Percentage %
Total			47	100 %
Respondents	Year	Senior	11	23.4%
		Junior	15	31.9%
		Sophomore	7	14.89%
		Freshman	14	29.8%

	Gender	Female	2	4.3%
		Male	45	95.7%
	Age	25-30	34	72.34%
		31-35	13	27.66%
		More than 35	0	0%
Total		47	100 %	

The second part of the questionnaire comprises thirty-two (32) items regarding effective teachers where each item indicates a contribution to teachers' effective teaching. Reliability refers to dependability or consistency of answers from one set of items to another occurring under very similar conditions (Neuman, 2014; Cohen, Manion & Morrison, 2013; Fraenkel, Wallen & Hyun, 1993) was done as part of another study. The internal consistency of the questionnaire was re-checked in the current study for the new sample of the participants. Cronbach's Alpha which is one of the three best-known ways (test-retest, equivalent-form, and internal-consistency methods) to test reliability coefficient was performed (Fraenkel, Wallen & Hyun, 1993).

Table 1. 2 Reliability test of the instrument

Cronbach's Alpha	Cronbach's Alpha based on standardized items	Number of items
0.844	0.970	32

A reliability analysis based on Cronbach's Alpha coefficient yielded acceptable results across all 32 items of the questionnaire, as shown in Table 1.2. The index for all items combined had alpha=0.970. This ensures that all of the items are internally reliable, and the instrument chosen for the current study is suitable.

3.5. Data Analysis

To address both research questions in the current study, the researcher solely relied on the quantitative data collection method.

The information is gathered using a closed-ended questionnaire that was provided to Afghan undergraduate students in order to determine effective teaching. The data is analyzed employing SPSS version 25, using descriptive statistics. According to Thompson (2009), “descriptive statistics are numbers that summarize the data to describe what occurred in the sample.”

4. Result

A total of 47 sets of valid questionnaires were collected from the participants through an online survey. In Section 1 of the Questionnaire, background information and the frequencies of the participants are counted. The second part is frequency related to effective teaching which is measured on a 5-point Likert scale. The scales range from strongly disagree (1), disagree (2), neutral (3), agree (4), or strongly agree (5) in response to each of the statements. Table 1.3 shows the percentage related to each item of effective teaching. The overall findings indicated students' agreement concerning effective teaching was with an average of 75.18% with minor disagreement 12.17% and 12.62% neutral.

Table 1.3 Effective Teaching

N	Statements	A	SA	N	D	SD
1		29.8	68.1	2.1	0	0
2	Demonstrate the research they take in their subject area.	59.6	14.9	14.9	2.1	8.5
3	Relate their research directly to module sessions.	55.3	17.0	14.9	6.4	6.4
4	Relate theory to work-based practices.	53.2	23.4	12.8	2.1	8.5
5	Encourage discussion.	44.7	29.8	8.5	8.5	8.5
6	Enable students to understand the content of each session.	61.7	14.9	4.3	12.8	6.4
7	Create a safe climate for all students to participate in the discussion.	51.1	23.4	12.8	6.4	6.4
8	Convey knowledge in a way that is accessible to students.	55.3	23.4	10.6	2.1	8.5
9	Ensure the relevance of information within sessions.	57.4	14.9	19.1	2.1	6.4

10	Do not put students on the spot when questioning.	46.8	12.8	27.7	6.4	6.4
11	Are patient.	51.1	14.9	17	12.8	4.3
12	Recognize that students learn at different rates.	48.9	21.3	10.6	12.8	6.4
13	Are prepared to explain.	57.4	25.5	6.4	6.4	4.3
14	Encourage students to ask questions.	46.8	34.0	2.1	10.6	6.4
15	Are enthusiastic about learning.	44.7	34.0	10.6	2.1	8.5
16	Explain any new language or concept clearly.	36.2	40.4	4.3	8.5	10.6
17	Acknowledge previous learning/work experience of students.	57.4	19.1	10.6	4.3	8.5
18	Are approachable.	34.0	34.0	21.3	4.3	6.4
19	Respect students' opinions.	48.9	44.7	6.4	0	0
20	Give clear guidance when asked for help.	57.4	17.0	25.5	0	0
21	Value students' contribution.	66.0	27.7	4.3	2.1	0
22	Give examples drawn from their own experiences.	31.9	34.0	29.8	4.3	0
23	Start sessions on time.	34.0	55.3	10.6	0	0
24	Use PowerPoint as prompt only.	23.4	8.5	14.9	44.7	8.5
25	Limit the information given in any one session.	61.7	6.4	19.1	6.4	6.4
26	Allow adequate time for discussion.	55.3	14.9	8.5	14.9	6.4
27	Give full citation for any references given.	46.8	19.1	25.5	6.4	2.1
28	Customise information for their students.	57.4	21.3	8.5	2.1	10.6
29	Explain inconsistency clearly.	51.1	17.0	19.1	4.3	8.5
30	Provide clear assessment briefs.	38.3	53.2	8.5	0	0
31	Include group activities during sessions.	53.2	27.7	8.5	6.4	4.3
32	Recap lesson	66.0	10.6	4.3	12.8	6.4
Total		49.46	25.72	12.62	6.72	5.45

The results of Table 1.3 indicate that students perceive that a number of teacher qualities and practices contribute to effective instruction. Analysis of the responses to the Likert scale questionnaire shows four responses with the highest proportion of strongly agree and agree. In this regard, item 1 which is to demonstrate excellent knowledge of their subject comes in the first rank in the highest agreement. Ninety-seven-point nine percent of the respondents show their agreement that in effective higher education teaching a teacher should demonstrate excellent knowledge of his or her subject. For item 21, 93.7% of the students agreed that effective teaching includes valuing students' contributions. This was closely followed by respecting students' opinions 93.6% and providing clear assessment briefs 91.5% respectively while none of them disagreed with these items. Starting sessions on time was agreed 89.4% whilst 10.6% were of neutral idea and no respondent was of disagreement. Two other items which consisting of prepare to explain 82.9% and both include group activities during sessions and encourage students to ask questions 80.8% were preferred to be part of the effective teaching only with 10% disagreement. The respondents' agreement indicates 78.7% with three items which are knowledge in a way that is accessible to students and is enthusiastic about learning and customize information for their students with only 10% of neutral each. Concerning item 4 which relates theory to work-based practices, item 6 enables students to understand the content of each session, item 16 explains any new language or concept clearly and item 33 recap lesson are agreed 76.6%. Item 18 which is acknowledged previous learning/work experience of students was reported 76.5%, closely followed with a percentage of 74.5 by three items that is item 7 create a safe climate for all students to participate in the discussion, encourage discussion, item 2 demonstrate the research they take in their subject area and item 21 give clear guidance when asked for help 74.4% while ensuring the relevance of information within sessions 72.3%, and the two others including recognize that students learn at different rates and allow adequate time for discussion are agreed 70.2%. The remaining items were perceived to be agreed less than 70% where item do not put students on the spot when questioning 59.6%, item 11 that is patient 66%, item 18 is approachable 68%, item 22 give examples drawn from their own experiences 65.9%, item 25 limit the information given in any one session 68.1%, item 27 give the full citation for any references given 65.9% and item 29 explain inconsistency clearly 68.1%.

5. Discussion

The findings of the current study indicate that three-fourth of the respondents expressed their agreement concerning effective teaching with a small number of students who stated either neutrality or disagreement. Meaning that a large number of the participants perceive that the stated skills are part of effective teaching. indeed, this facet of effective teaching also features that students believe that effective teaching in higher education requires teachers to demonstrate excellent knowledge of his or her subject, value students' contribution, respect students' opinions and provide clear assessment briefs with minimal disagreement to each of the mentioned items. This broad level agreement of the participants points that effective teaching must include the mentioned characteristics. Starting sessions on time was what emphasized as part of the best teaching practices with more than three-fourth of the respondents. This suggests that students do indeed regard in high esteem those teachers who prioritize their teaching. It may also imply that teachers in higher education are loosely following time management in the context of Afghanistan. Besides, what is of importance is that a large number of the participants agree that effective teaching takes place when teachers prepare to explain and include group activities during sessions and encourage students to ask questions. The high value placed by students on group activities and encouraging discussion in sessions chimes with the consensus of teachers' views on the contribution that varying ways of teaching content, promoting active learning,

and assuring a high level of engagement make to effective learning. This means that students are concerned with their active involvement in the classroom. This finding is consistent with the study of Allan, Clarke, and Jopling who found that a high value placed by students on including group activities and encouraging discussion in sessions chimes with the consensus of teachers' views on the contribution that varying ways of teaching of content, promoting active learning, and assuring a high level of engagement make to effective learning. Lacking preparation to explain and not involving students in group activities can be part of ineffective instruction and learning. The respondents' agreement indicates that the presentation of knowledge has to be in a way that is accessible to students. In fact, inaccessibility to intended knowledge in line with the objectives specified in the related syllabus and curriculum defects the important part which is learning. This is because of the information which students should access first and then prepare to learn. Being enthusiastic about learning is the other characteristic of productive and efficient teaching agreed to a great extent by the students indicating that a strong feeling and excitement about learning is

required for a more powerful teaching environment. Subsequently, a similar agreement of the respondents in relation to customize information for students signifies those teachers should bring changes in the information to fit the needs or requirements of the students. In addition, the majority of the participants indicated their agreement towards relating theory to work-based practices, enabling students to understand the content of each session, explaining any new language or concept clearly, recapping lessons, and acknowledging previous learning or work experience of students. To teach effectively, teachers are required to consider the named traits seriously. Two-third of respondents were in favor of the notions that creating a safe climate for all students to participate in the discussion, encourage discussion, demonstrating the research they take in their subject area, and giving clear guidance when asked for help should be integrated in effective teaching while closely followed by ensuring the relevance of information within sessions, recognizing that students learn at different rates and allowing adequate time for discussion are agreed.

6. Conclusion

It is often portrayed in literature and academic settings that effective teaching practices are clearly important for raising students' achievement, and characteristics of the same are rather mysterious. Hence, the aim of this study was to investigating Afghan undergraduate students' perceptions towards effective teaching.

The findings indicate that students considered a supportive learning environment in which teachers scaffold learning as a requirement of good teaching. This is supported by each of the top-ranked items. The students not only prefer activities that directly contribute to the improvement of learning but also emphasize instructional techniques and teachers' characteristics that help in the fostering relationship between students and teachers. This implies that students consider themselves as active participants in learning, not just mere recipients of knowledge. the present study is a small step in part because of its small size of participants, perception of the Faculty of Languages and Literature learners, and the quantitative data for this study are only based on the self-report questionnaire. But it is hoped that the findings in this study will help future researchers study this issue with more learners in-depth.

7. References

- Allan, J., Clarke, K., & Jopling, M. (2009). Effective Teaching in Higher Education: Perceptions of First-Year Undergraduate Students. *International Journal of Teaching and Learning in Higher Education*, 21(3), 362-372.
- Anderson, L. (1991). Fundamentals of educational planning series: Increasing teacher effectiveness. Paris: UNESCO: International Institute for Educational Planning.
- Cohen, L., Manion, L., Morrison, K. (2013). Research Methods in Education. London: Routledge.
- Creswell, J. W. (2012). Educational research: planning. *Conducting, and Evaluating*. New York: Pearson Education, Inc.
- Davis, B. G. (2009). Tools for teaching (2nd ed.). San Francisco, CA: Jossey-Bass.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (1993). How to design and evaluate research in education (Vol. 7). New York: McGraw-Hill.
- Galbraith, M. (2004). Adult learning methods: A guide for effective instruction (3rd ed.). Malabar, FL: Krieger.
- Hande, H. S., Kamath, S. R., & D'Souza, J. (2014). Students' perception of effective teaching practices in a medical school. *Education in Medicine Journal*, 6(3), 63-66.
- Hooks, b. (1994). Teaching to transgress: Education as the practice of freedom. New York, NY: Routledge.
- Hyland, T. (2010). Mindfulness, adult learning and therapeutic education: Integrating the cognitive and affective dimensions of learning. *International Journal of Lifelong Education*, 29, 517-532.
- Kanuka, H. (2010). Characteristics of effective and sustainable teacher development programmes for quality teaching in higher education. *Higher Education Management and Policy*, 22(2), 69-81.
- Kasworm, C. E. (2008). Emotional challenges of adult learners in higher education. *New Directions for Adult and Continuing Education*, 2008(120), 27-34.
- Mathers, N., Fox, N., & Hunn, A. (2007). Surveys and Questionnaires. Trent Focus Group.
- Neuman, W. L. (2014). *Social research methods: Qualitative and quantitative approaches*. Boston: Pearson.
- Ravitch, D. (2010). The death and life of the great American school system: How testing and choice are undermining education. New York: Basic Books.

- Reynolds, D. M. D. (2011). *Effective Teaching Evidence and Practice* (third ed.). Los Angeles: SAGE.
- Schoeberlein, D. (2009). *Mindful teaching and teaching mindfulness: A guide for anyone who teaches anything*. Boston, MA: Wisdom.
- Sharma, G. (2017). Pros and cons of different sampling techniques. *International journal of applied research*, 3(7), 749-752.
- Svinicki, M., & McKeachie, W. J. (2010). *McKeachie's teaching tips: Strategies, research, and theory for college and university teachers* (13th ed.). Belmont, CA: Wadsworth.
- Thompson, C. B. (2009). Descriptive data analysis. *Air medical journal*, 28(2), 56-59.
- Tracy, S.J. (2013) *Qualitative research methods*. Wiley-Black Well, West Sussex.
- Vella, J. (2008). *On teaching and learning: Putting the principles and practices of dialogue education into action*. San Francisco, CA: Jossey-Bass.
- Weimer, M. (2002). *Learner-centered teaching: Five key changes to practice*. San Francisco, CA: Jossey-Bass.
- Wright, W., & O'Neil, M. (1992). Improving summative student ratings of instruction practice. *Journal of Staff, Program, and Organizational Development*, 10, 75-85.
- Claybaugh, Zach. "Research Guides: Organizing Academic Research Papers: Types of Research Designs". library.sacredheart.edu. Retrieved 2021-9-7.

Copyright © 2021 aridullah Farid, Mirza Khan Nikzoy, Wali Khan Monib, AJRSP. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY NC).

Doi: doi.org/10.52132/Ajrsp.e.2021.307