



Lebanese University

LEBANESE UNIVERSITY
FACULTY OF DENTAL MEDICINE
RESEARCH STRATEGY

INTRODUCTION

Research is a very important pillar at the Faculty of Dental Medicine in supporting the education of under and post graduate students. Our academic programs provide a range of opportunities to interested students to do research and get involved in clinical training with basic or applied research approach.

Mission, Vision and Values

The Vision and Mission of Research at the Faculty of Dental Medicine are aligned with those of the Lebanese University:

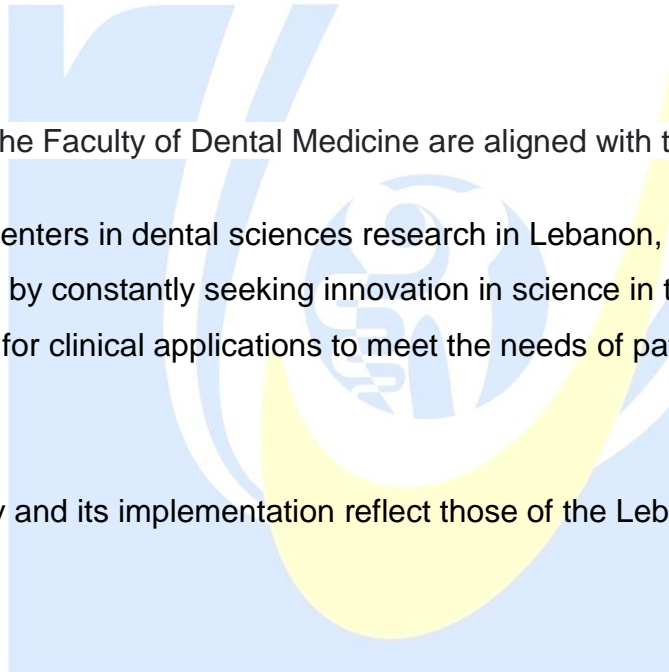
- To become one of the reference centers in dental sciences research in Lebanon, regionally and internationally.
- To achieve excellence and quality by constantly seeking innovation in science in the different fields of dentistry.
- To develop technologies targeted for clinical applications to meet the needs of patients.

Core Values

The core values of the Research Strategy and its implementation reflect those of the Lebanese University:

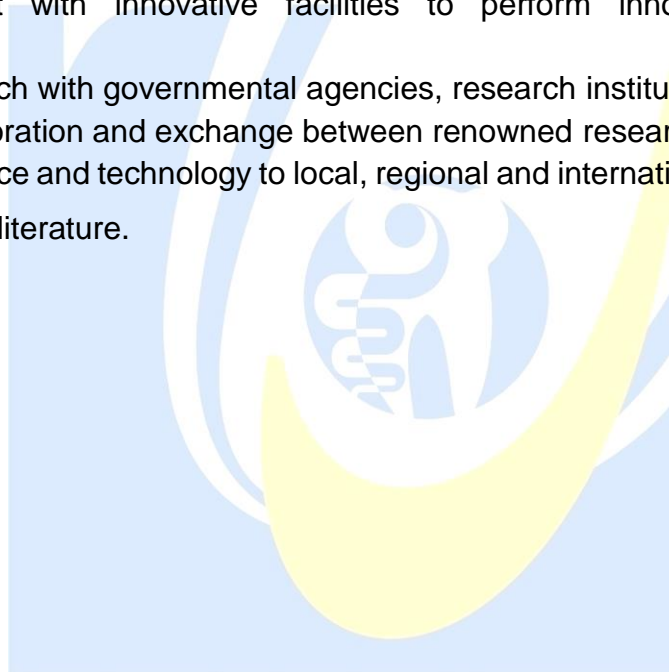
- Integrity
- Excellence
- Innovation
- Collaboration

- Inclusiveness



Strategic Goals

- 1- Promoting Research as an integral part of education at the Lebanese University.
- 2- Exposing students to environment of translational and applied research.
- 3- Enhancing a cooperation and expertise exchange between different research centers and faculties at the Lebanese University.
- 4- Providing foster environment with innovative facilities to perform innovative research leading to intellectual commercialization.
- 5- Increasing collaborative research with governmental agencies, research institutions and the industry at large.
- 6- Enhancing international collaboration and exchange between renowned research centers.
- 7- Facilitating the transfer of science and technology to local, regional and international audiences by providing critical reviews and publications to the current literature.



A- CURRENT RESEARCH STATUS

1- Doctorate Program

Research at the Faculty of Dental Medicine (FDM) was always an interesting chapter for faculty members but the turning point started in 2014 after the relaunch of the Doctorate in Odontological Sciences (DSO) program that is solely tailored for faculty members, for a minimum period of two years requiring the publication of 2 papers in PUBMED indexed journals in order to be eligible to thesis defense.

- ❖ Since 2014 till present (April 2021) 22 doctorate thesis were defended.
- ❖ Since 2014 till 2020 **193 papers** were published in PUBMED indexed journals.
- ❖ Table.1 report the number of published papers since 2014 and the distribution as: from doctorate, original research or review/case report.
- ❖ Figure.1 show the publications status at the Faculty of Dental Medicine from 1988 until 2020.
- ❖ The bulk of the research work at the Faculty of Dental Medicine since 2014 was performed within the Doctorate program (DSO) frame with a main impact on the faculty members that aside their academic promotion will be able to supervise and transfer the research expertise and spirit to both students and colleagues.

Figure.1

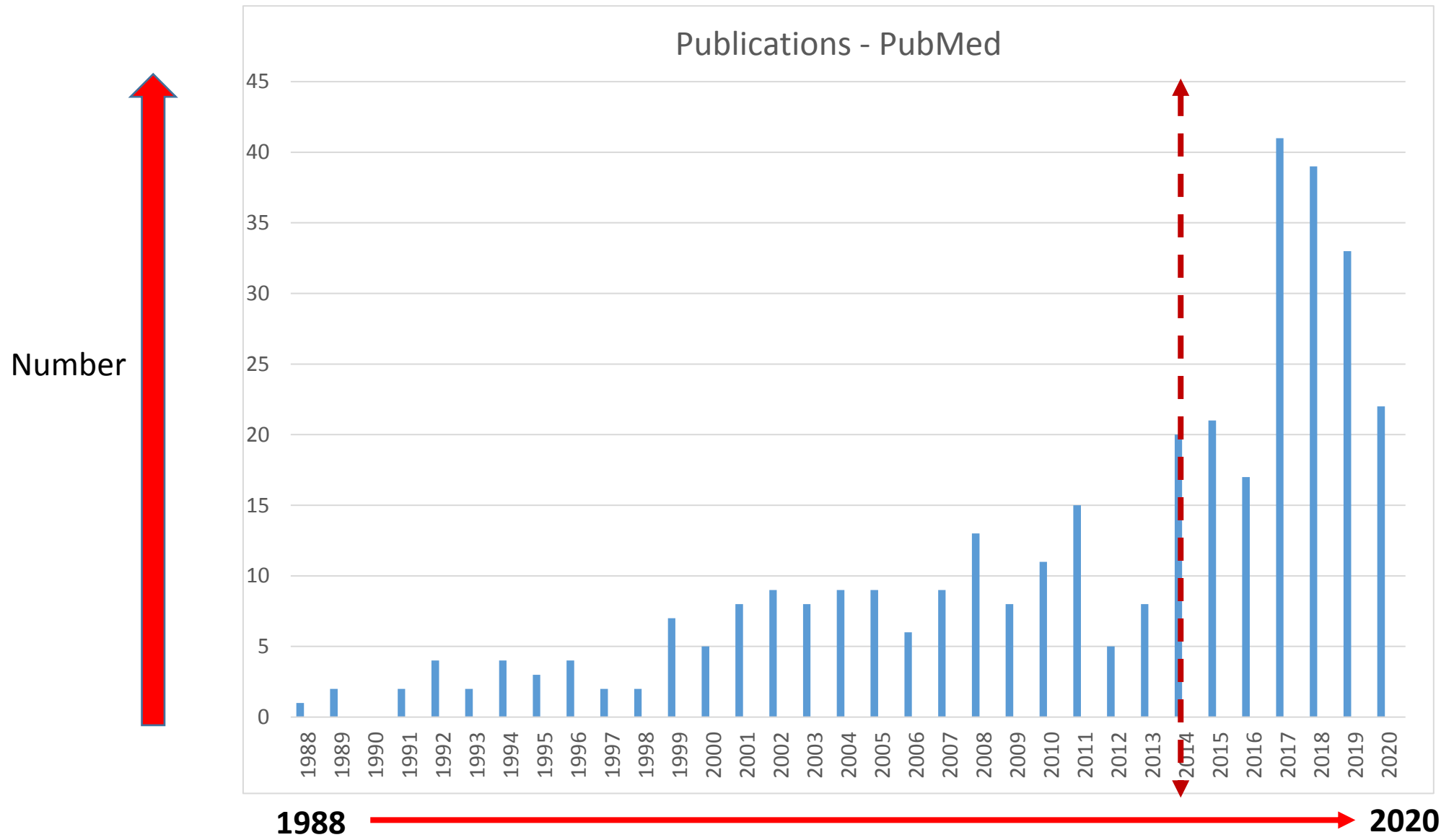


Table. 1

YEAR	N	Doctorate	Original	Review / Case report	
2014	20	6	9	5	
2015	21	4	13	4	
2016	17	5	8	4	
2017	41	17	18	6	
2018	39	20	15	4	
2019	33	21	8	4	
2020	22	8	8	6	

2- Master Program

The Master program in different specialties (Oral Surgery, Periodontology, Pediatric Dentistry, Orthodontics, Forensic Dentistry, Prosthodontics, Oral Diagnosis & Radiology, Restorative Dentistry & Endodontics) was acknowledged by the University Council (to replace the previous DESS) in 2017. Two type of Master degree are available: Master **in** the specialty or Master **of Science** in the specialty; the difference between both types is the thesis in the Master of Science that should be an original research defended publicly after publication of an article in PUBMED indexed journals.

3- Undergraduate Program

Dental students are exposed to research through lectures and seminars over the undergraduate program. Faculty members will implement the clinical training with basic or applied research approach.

4- Research Center

The Research Center was created following the new decree regulating academic and clinical promotion at the Faculty of Dental Medicine.

The Research Council include a Director and 4 faculty members appointed by the President of the University after Dean's suggestion.

The aims of the Research Center are:

- Supervise, support and direct the research projects and researchers at the Faculty of Dental Medicine
- Help in raising funds and connecting researchers with international institutions and supporting company's

- Review submitted articles and research projects
- Coordinate with Central Ethical Committee of the University
- Design and implement the research strategy of the Faculty of Dental Medicine

5- Research Facilities at the Faculty of Dental Medicine

Different types of Research are conducted at the Faculty of Dental medicine: Clinical, Animal and Laboratory. Clinical studies are conducted within the premises of the Faculty following a rigorous detailed plan after clearance from the Research Council and Ethical Committee.

Two laboratories are currently available at the FDM:

- *The Forensic and Human Identification Research Lab*: was the first lab to be created, supporting research projects in the forensic and human identification area. The center is equipped with a stereophotogrammetry device (Vectra M3, Canfield Scientific Inc, USA), Dolphin Imaging software (Dolphin Imaging and Management Solutions, Version 11.8, La Jolla, California, USA) and intra-oral scanner (Trios 3, 3Shape) operated by experts and faculty members of the Forensic Science department.
- *The Center of Excellence in Digitalization, 3D Printing and Biomaterials*:
The Center equipped with latest digital technology related to dental sciences; Intraoral scanner, 3D Printers, Chairside milling machine, furnaces, all CAD-CAM related software. As well, testing equipment for dental materials: Cyclic loading, Universal Testing machines, Shear test device, slow cutting saw, microscopes, thermocycler, sandblasters.

- When other facility and testing equipment are needed, researcher can use the other centers and platform of the Lebanese University: Faculty of Agronomy, Doctoral School of Science and Technology, Doctoral School of Nano Technology, Faculty of Sciences, Faculty of Engineering...

B- OBJECTIVES IN RESEARCH

Objectif 1: Create a collaborative culture for research

- Provide and develop an environment of cooperation and partnership through multidisciplinary research teams,
- Explore new areas of innovative research through leading interdisciplinary research initiatives involving national and international collaborations.
- Encourage faculty and students active in research to offer training / seminars, such as good research practices, research methods, how to write a thesis, the principles of a literature review, research ethics, the organization of authors on publications, good research and publication practices ...
- Launch scientific days by encouraging collaborative coordination and inviting renown international and local/regional researchers.
- Support the integration of new researchers; support mobility within and outside the country in coordination with the International Relations Office.
- Establish close links between public and private research institutions.
- It is also very important to establish collaborations, aiming to have multidisciplinary projects that can be published in journals with high impact.
- Create the Investigator Support Unit (ISU) to help researchers in writing, statistics and publication.

Objectif 2: Promote research through education programs and projects with national and international support.

- Broaden the opportunities for students / faculty members to participate in research projects under the mentorship of professors, which helps them to get more involved in research.
- Develop and implement postgraduate training and professional development programs. Research Master degrees could be added.

Objectif 3: Evaluate and improve the research infrastructure on the basis of innovative programs and best practice models.

- Intensify the innovation dynamic, develop and implement clear policies and procedures to improve innovation.
- Build recognized national centers of excellence for research in certain fields- mainly innovative related to dental sciences- , after reassessing the resources and structure of the teams to support innovation and quality (consider accreditation of research structures).
- Develop clear procedures for internal requests for grants and materials.
- Structure, activate and improve the functioning of research laboratories: The regrouping of research teams in laboratories after the implementation of a reference framework for the creation of new laboratories.
- Develop an effective budgeting system to support research activities.

Objectif 4: Build a unified, coherent and transparent research evaluation system.

- The main performance indicators will be the quality and volume of its knowledge production, its visibility and its value. We must therefore pursue a policy of scientific production: whatever the themes and phases of research, it is important to develop a harmonized policy for scientific production, based on publication and promotion. This objective must consider the current rules which prevail worldwide for the evaluation of the quality of scientific production, as well as their biases.

Objectif 5: Collect necessary funds for research.

- Expand the resources related to doctoral programs by securing external funding from different sources and agencies, to create vital and sustainable research teams and programs, to increase national recognition and competitiveness, and prioritize programs of research
 - a. Grants/scholarships to students
 - b. Research funded by Lebanese University funds
 - c. Research financed by government funds, ministries and other public authorities
 - d. Research financed by private funds / WHO, grants from firms and private companies (without restriction), and international donors (foundation, initiatives, , etc.).

Objectif 6: Improve the visibility of research in the institution

- Broaden the communication of research results to inform and influence the scientific community, professionals, the general public and decision-makers; via newsletter publication, “Open Day”, inter-faculty/department days, calendar of research activities, publication on the website...
- Encourage the publication of results in recognized journals and sites. Help should be given to researchers for this purpose. Research activities are also archived and monitored on international platforms (Researchgate and GoogleScholar for example); this monitoring would serve to improve policies for researchers.
- Creation of the Research Bulletin

c- SWOT analysis - Faculty of Dental Medicine

- Lebanese University

Items	Items	
Strengths	<ul style="list-style-type: none"> • Good clinical set up • Diversity of faculty members' specialties • Diversity of faculty member's training background • High level of Faculty member's clinical training • Venues for research presentation • High number of faculty with Doctorate degree 	<ul style="list-style-type: none"> • Clear research publication policy and promotion criteria • Diversified cooperation with local, regional and international universities and academic institutions • Staff and faculty member's motivation • Available research facilities: Forensic research lab and center of excellence in Digitalization, 3D Printing and Biomaterials
Weaknesses	<ul style="list-style-type: none"> • Facilities and testing equipment • Research funds • Devaluation of Lebanese currency vs US Dollars • Faculty preparation and training for research • Student involvement in research projects • Lack of investigator support unit (writing, biostat, publication) • Research Staff (qualified research assistants) 	<ul style="list-style-type: none"> • Interdepartmental collaboration • Visibility of the faculty research • Research directions and themes • Translational research • Innovation and patent • Collaboration within different institutions at the Lebanese University and at National level • Homogeneous research groups
Opportunities	<ul style="list-style-type: none"> • Implementation of an Investigator Support Unit to help researchers in writing, statistics and publication. • Courses and Seminars on research (methodology, writing.) for Faculty and students • Graduate programs to update • Creation of Research Bulletin • Research events • Improvement of publication quality (impact factor) 	<ul style="list-style-type: none"> • Mentorship of senior to junior faculty • Enhancing contact with different international organizations and institutions for funds raising • Lobbying with journal editors • Faculty and students exchange and mobility with collaborative research centers and universities
Threats	<ul style="list-style-type: none"> • Impact of COVID-19 pandemic crisis • Country economic crisis and local currency devaluation • Country political instability • Faculty and research negatively affected by the above 	<ul style="list-style-type: none"> • High competition from other faculties/universities •

ACTION PLAN

Governance & Support	Schedule	Timeline
<ul style="list-style-type: none"> • Implementation of the Investigator Support Unit (ISU) to help researchers in writing, statistics and publication. • Establish priority axes and a clear structure of research laboratories in coordination with all academic departments • Position the FDM as a regional center of excellence for Research and Development • Regularly evaluate research results by faculty members • Grant writing should be encouraged in cooperation with local, regional and international organizations and institutions so that research generates money for the FDM • Quality assessment of submitted research projects 		
Optimization of Cooperation		
<ul style="list-style-type: none"> • Participate in national and international research projects through collaboration with other research teams • Establish a culture of interprofessional research collaboration: doctors, pharmacist, basic science, engineers... • Aim for performing multicenter studies to improve data collection pace and projects dimension • Improve communication among the faculty members from different departments of the FDM • Improve cooperation between faculty members of FDM and other faculties and research platforms at the Lebanese University • Organize social and scientific events based on research themes • Collaborate with competing universities researchers as much as possible • Enhance co-direction of research projects (Doctorate) with renown foreign researchers and universities • Increase Faculty and Students mobility within cooperation agreements in collaboration with the International Relations Office at the Lebanese University (update agreements to reflect research cooperation) 		
Equipment & Facilities		
<ul style="list-style-type: none"> • Maintain the facilities and equipment currently available and expand them if possible • Discuss the purchasing procedure complexity and possible solutions with the purchasing office at the LU central administration • Improve the equipment purchasing channels outside the faculty/school by communicating with possible sponsors and NGOs • Manage currently available space by optimizing its use by faculty members • Use space and equipment of collaborators (inside and outside the faculty) 		

Resources for Research		
<ul style="list-style-type: none"> • Work to secure more grants at a steady pace for the continued availability of materials and equipment • Apply for grants for clinical/laboratory research, from pharmaceutical/dental companies (unrestricted grants) • Apply for grants from Lebanese University Research office as well from other support local/regional organization (CDRC....) • Enhance research projects with social impact that increase the grant and funding possibilities • Increase collaboration and multi-centric studies that facilitate funding support 		
Students & Faculty members Training		
<ul style="list-style-type: none"> • Educate interested faculty to become world class researchers • Improve the skills of graduate students through research courses • Regular research training workshops for undergraduate and postgraduate students and assistants • Continuous education and faculty development on methods to improve research skills • Let students and faculty attend technical skills offered through the post graduate programs • Organize seminars with renown international researchers • Integrate more research experience into the program as para-curricular activities • Update regularly curricula to be aligned with good research practices and inform researchers about it 		
New positions & Recruitment		
<ul style="list-style-type: none"> • Consider hiring research faculties to enhance research outcomes of the departments and the faculty • Follow up to have visiting professors based on research skills • Prioritize research skills during any faculty recruitment • Appoint research coordinator to improve collaboration between departments and clinical research 		
Improve Visibility		
<p>Visibility of the faculty should be enhanced through:</p> <ul style="list-style-type: none"> • a repository for the faculty publications • regular research events at local, national and regional levels <p>- invited speakers and faculty presentations</p> <p>- showcase of research success</p> <p>- participation in national and international research events</p> <ul style="list-style-type: none"> • Carefully identify venues for publication and lobby with editors • Identify and develop areas of excellence in research • Move more toward innovative research themes for better publications level and impact factor • Creation of the Research Bulletin of the FDM 		

Research integration into teaching

15 questions were asked regarding the way the faculty member integrates his own research experience into teaching the students at the undergraduate level. The details of the responses are shown in Table 3. The main findings were:

- There is a lack in the availability of research facilities at the faculty: Only 31.7% agreed that they are enough, and the average score was 2.91 out of 5.
- Only 42% of the respondents agreed that they are aware of funding programs for research projects at the faculty (score 2.96).
- The highest score (4.36) in this category was obtained for the question related to encouraging students to have a post graduate degree that includes a research work.

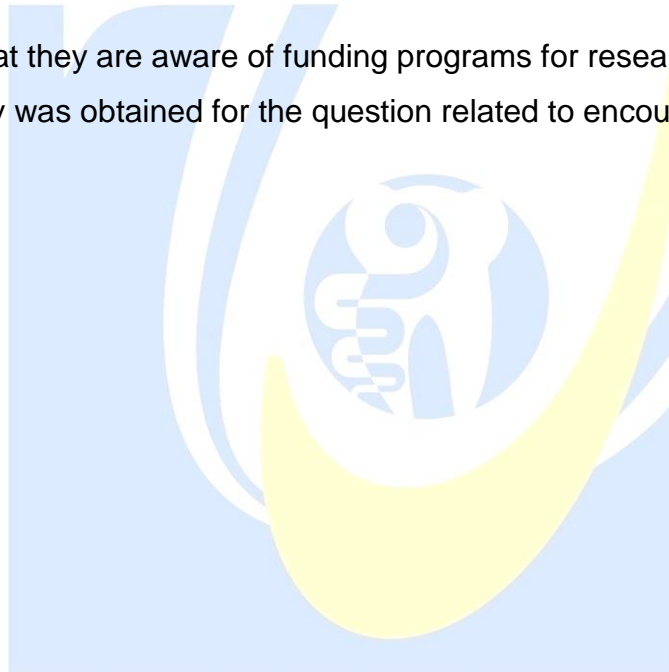


Table. Research integration into teaching

Question	1: : Strongly disagree		2: Disagree		3: Neutral		4: Agree		5: Strongly agree		NA		Score	
	n	%	n	%	n	%	n	%	n	%	n	%		
Research integration into teaching														
I believe all my department teaching staff should be involved in research	0	0	3	1.8	7	4.3	72	43.9	77	47	5	3	4.27	1.00
I would like to be part of one of the research teams at the Faculty	1	0.6	3	1.8	11	6.7	57	34.8	87	53	5	3	4.29	1.07
I make recommendations to the department chairperson about new teaching and learning methods	1	0.6	2	1.2	34	20.7	84	51.2	30	18.3	13	7.9	3.62	1.27
I attend workshops and webinars to enhance my research skills	1	0.6	2	1.2	6	3.7	61	37.2	86	52.4	8	4.9	4.25	1.18
I encourage students to attend workshops and webinars related to in-text citation and referencing in research	0	0	1	0.6	0	0	70	42.7	85	51.8	8	4.9	4.31	1.11
I use my research skills to enhance the content material of my courses	1	0.6	0	0	5	3	64	39	83	50.6	11	6.7	4.19	1.28
There are enough facilities for conducting research at the faculty	13	7.9	32	19.5	61	37.2	42	25.6	10	6.1	6	3.7	2.91	1.16
I encourage students to use inquiry and scientific methods in collecting primary data for different assigned projects (written or oral)	0	0	1	0.6	11	6.7	82	50	56	34.1	14	8.5	3.92	1.34
I teach students to critically read and select references	0	0	0	0	9	5.5	64	39	79	48.2	12	7.3	4.13	1.30
I use projects and assignments to assess students' competencies	0	0	3	1.8	18	11	83	50.6	37	22.6	23	14	3.52	1.56
I evaluate the knowledge of my undergraduate/postgraduate students in research writing using portfolios, reports or their thesis preparation	1	0.6	2	1.2	23	14	72	43.9	33	20.1	33	20.1	3.21	1.75
I use my research publications to update my courses	0	0	1	0.6	13	7.9	71	43.3	60	36.6	19	11.6	3.81	1.52
I encourage students to be involved in research projects	12	0	0	0	12	7.3	73	44.5	69	42.1	10	6.1	4.10	1.21
I encourage students to have a post graduate degree that includes a research work	1	0.6	0	0	5	3	61	37.2	91	55.5	6	3.7	4.36	1.05
I am aware of funding programs for research projects at the faculty	13.0	7.9	28.0	17.1	39.0	23.8	45.0	27.4	24.0	14.6	15.0	9.1	2.96	1.48
AVERAGE	44		78		254		1001		907		31		3.86	