كلية الخليج
GULF COLLEGE

Research Annual Report

Research Department

Centre for Postgraduate Studies and Research

2018-2019

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List of Abbreviations

Abbr.	Description
AY	Academic Year
BFP	Block Funding Programme
CFS	Centre for Foundation Studies
Co-I	Co-Investigator
Co-PI	Co-Principal Investigator
CPSR	Centre for Postgraduate Studies and Research
DDAAR	Deputy Dean-Academic Affairs and Research
FBMS	Faculty of Business and Management Studies
FCS	Faculty of Computing Sciences
GC	Gulf College
GRG	Graduate Research Grant
IG	Internal Grant
MoCI	Ministry of Commerce and Industry
PI	Principal Investigator
RC	Research Committee
RD	Research Department
RF	Research Form
RG	Research Grant
TRC	The Research Council
URG	Undergraduate Research Grant

Message from Deputy Dean- Academic Affairs and Research

One of the main College objectives is to advance research, in which we strive to assist and encourage our researchers (faculty members and students) to conduct original research by identifying new opportunities, developing collaborations and establishing partnerships between faculty members, industries, and government agencies.

Research is one of the main objectives of Gulf College which leads the creation of a vibrant distinct research culture, one that generates findings and ideas of domestic and international significance. The Research Department aims at creating an environment that enables innovative research and scholarship; disseminating research findings effectively through publications in refereed journals, and conferences both locally and internationally; translating research goals into best-practice solutions and research projects with lasting impact to the economic growth and development in the society.

We, at Gulf College, would like to develop Research Groups to foster academic excellence by promoting high-impact research in innovative areas of relevance to local society, region and world to increase research output and international collaborations. Research Groups provide a platform for faculty members with intersecting interests to exchange ideas and develop research initiatives.

We are proud to say that the statistics show a steady growth in the number and type of research activities in the College over the last few years.

I hope the information available in this framework is useful to our researchers. We will be glad to receive feedback and comments from our students, faculty members, researchers and our partners worldwide.

Dr. Ali Al-Badi
Deputy Dean- Academic Affairs and Research

Research Objectives

The following figure shows the research objectives of the College for the upcoming five years:

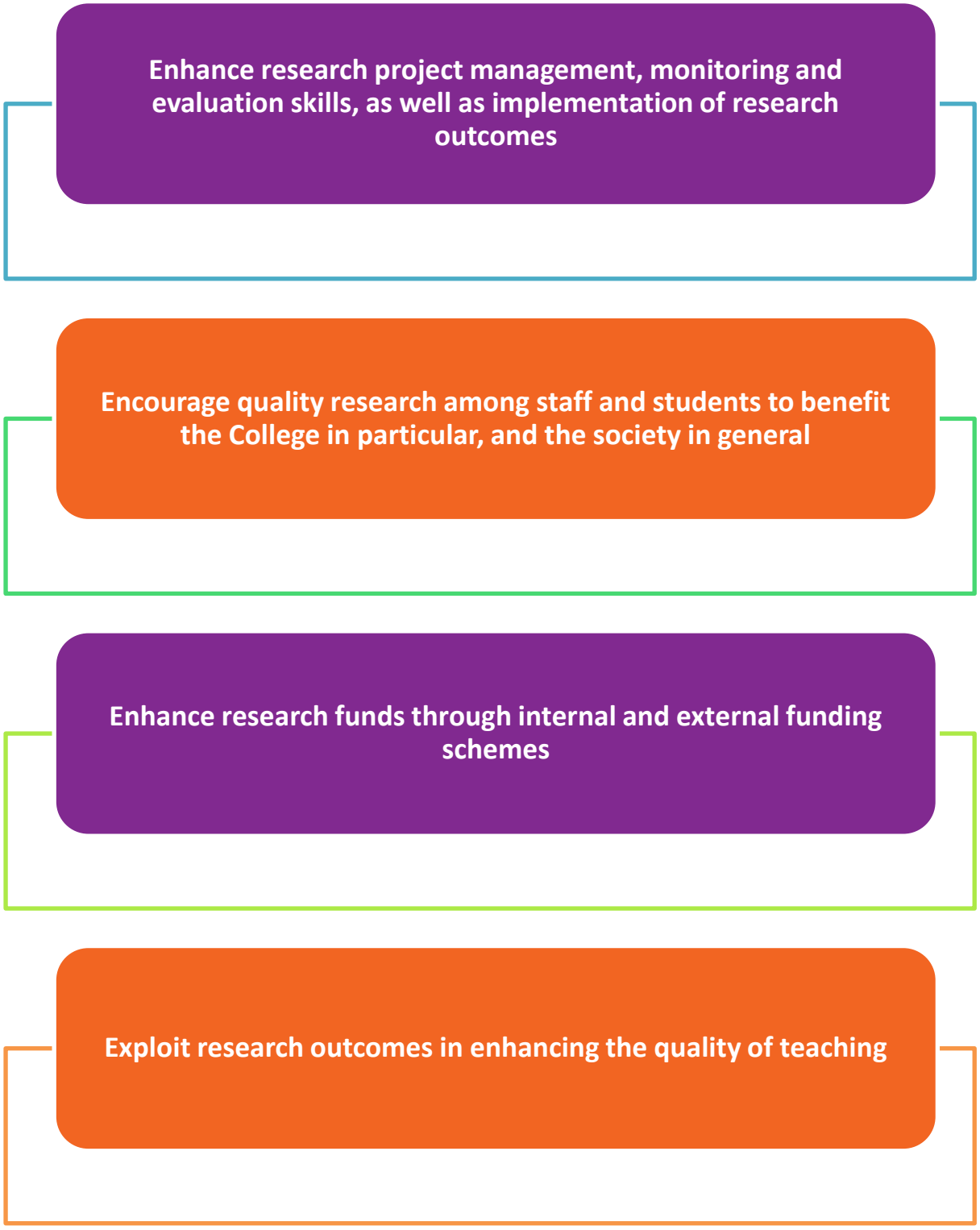

Figure 1: Gulf College Research Objectives

Research Strategic Change Agenda

The following diagram shows where we currently are and where we need to be in the very near future:

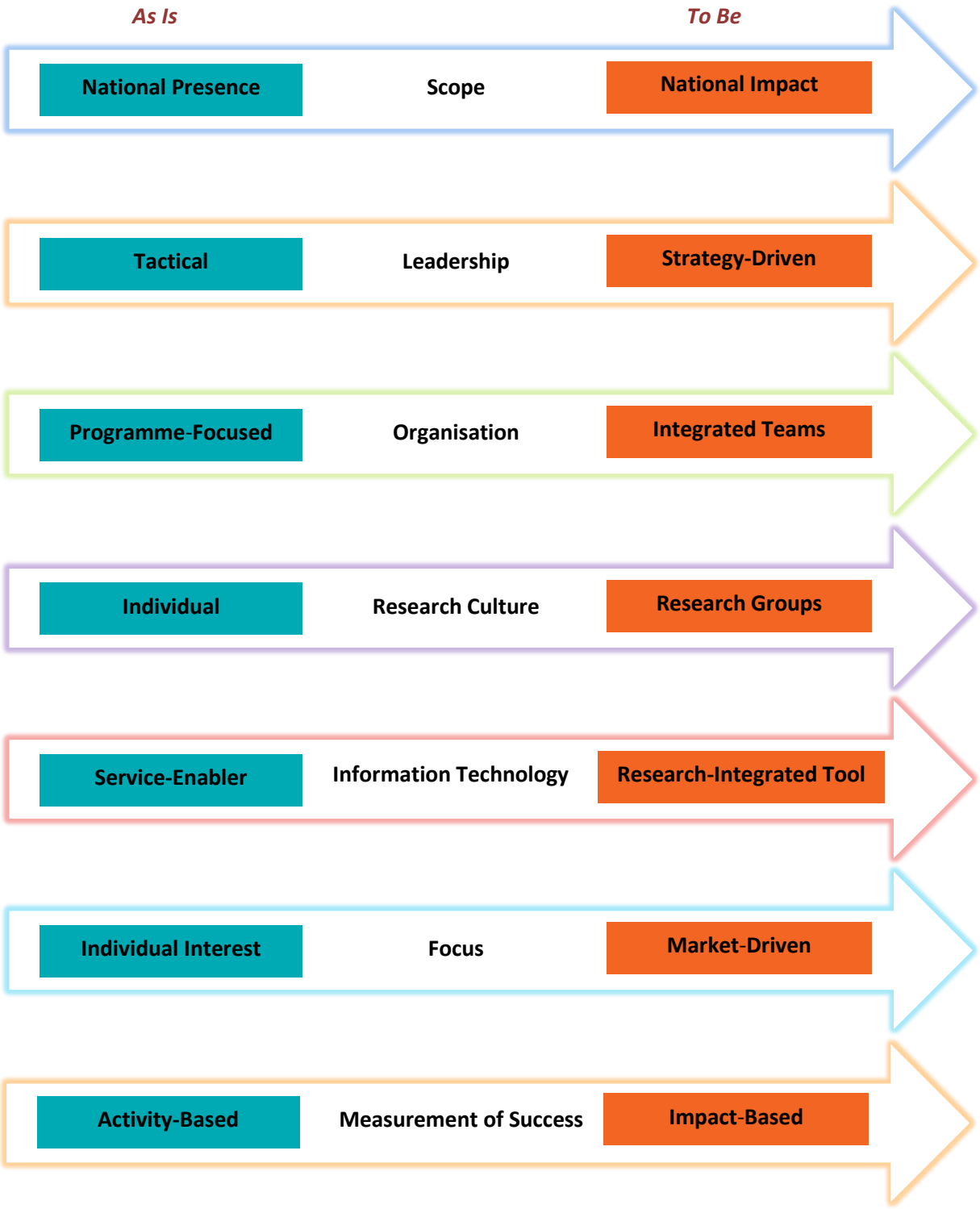

Figure 2: Gulf College Research Strategic Change Agenda (adapted from Kaplan & Norton, 1996)

Staff and Student Publications

Centre for Foundation Studies

Journal Publications

Adarbah, H. Y., & Ahmad, S. (2019). Channel-adaptive probabilistic broadcast in route discovery mechanism of MANETs. *Journal of Communications Software and Systems, 15*(1), 34-43.

Cuizon, R.O., Haider, A.G. (2019). Intervening effect of teacher-quality on the relationship between student attitude and academic outcomes in mathematics. *International Journal of Engineering and Future Technology, 16*(2).

Mallillin, L.L.D. (2018). Assessment of the general study skills performance of students in the centre of foundation studies. *European Journal of Education Studies, 5*(6), 253-271.

Ancheta, R.F. (2018). Review on the delivery of general study skills module: A tutors' experience. *European Journal of Education Studies, 5*(4), 13-26.

Conference Publications

Nouraey, P. (2019, August). *Students' attitudes towards written error corrections: A study in an Omani EFL context*. Paper Presented at International Conference on Social Science and Humanities (ICSSH), Doha, Qatar.

Nouraey, P. (2019, April). *Potential psycholinguistic speech errors among undergraduate students: A case-study*. Paper Presented at Oman 19th International ELT Conference: Innovative Approaches to English Language Teaching and Learning, Muscat, Oman.

Cuarteros, J.B. (2019, April). *Effects of research performance of faculty on the correlation between teaching outcomes and quality management engagement*. Paper Presented at QS-MAPLE 2019, Dubai, UAE.

Nouraey, P. (2019, February). *A theoretical model for speech errors*. Paper Presented at the 13th International Conference on Psychology and Sociology, Tehran, Iran.

Faculty of Business and Management Studies

Journal Publications

Bocar, A.C., & Allen, S.S. (2019). Foremost factor that distracts students' achievement on academic goals and their prevailing stress reliever activities. *International Journal of Recent Technology and Engineering, 7*(6S5), 828-838.

Amin, F., & Sulthana, M.N. (2019). Impact of financing sources on innovation and firm productivity: Evidence from South Asia. *International Journal of Managerial Studies and Research*, 7(7), 7-13.

Getaruelas, R. (2019). Impact of social media advertisement to the customer product brand awareness of selected international coffee shops in Muscat, Oman: An inquiry to the customer. *Asian Journal of Management Sciences & Education, 8*(1).

Sulthana, N., & Al-Balushi, S. (2018). A study on role of brand image development of Samsung electronics company. *International Journal of Business and General Management*, *7*(6), 67-74.

Bocar, A.C., & Al-Wahaibi, A.S.M. (2018). Cultural, Social, and national setting and the most common factor that hinders women's empowerment. *Advances in Social Sciences Research Journal, 5*(3), 43-50.

Sulthana, N., & Rathiya, D.N.M. (2018). A Study on the effects of sales training on sales force activity in Napier Healthcare company. *International Journal of Research in Business Management*, *6*(10), 1-8.

Sulthana, N., & Mattar, A.S. (2018). A study on effectiveness of advertisement in Bank Muscat. *International Journal of Business and General management*, *7*(3), 53-60.

Srinammuang, P., & Petcharat, N. (2018). Management accountant's role in moving towards a corporate sustainability in Thailand. *International Journal of Business and Management*,*6* (2), 78-89.

Srinammuang, P., & Petcharat, N. (2018). An integrated reporting system for sustainable value creation of Thai-listed companies. *International Journal of Management and Applied Science (IJMAS) 4*, 32-37.

Conference Publications

Bocar, A., Rachmawati, A., & Rahmawati, S. (2019, July). *Teachers revelation on the level of their self-motivation*. Paper Presented at 2019 BES Conference, Semarang, Central Java, Indonesia.

Bocar, A., Gliten, J., Rachmawati, A., & Mulyaningsih, H. (2019, July). *Top three predominant causes of failure in corporate managership: Employees' insight*. Paper Presented at the SOSCIS, Semarang, Central Java, Indonesia.

Getaruelas, R. (2019, July). *Competency-based skills and training needs of hotel and restaurant employees towards key position in Muscat, Oman: An inquiry*. Paper Presented at The International Conference on Management, Engineering, Science, Social Sciences and Humanities, Phuket, Thailand.

Petcharat, N., & Srinammuang, P. (2019, July). *Can environmental and social performance of Thai-listed companies create sustainable value?.* Paper Presented at the Interdisciplinary Business & Economic Research, Osaka, Japan.

Sulthana, N., Mustafa, M., & Diljan, K. (2019, April). *Factors affecting customer's adoption of mobile banking in the Sultanate of Oman*. Paper Presented at Emerging Global Business Paradigms and Contemporary Management Issues (EGBPC 2019), Muscat, Oman.

Faculty of Computing Sciences

Journal Publications

Najar, F., Bourouis, S., Al-Azawi, R., & Al-Badi, A. (2019). Online recognition via a finite mixture of multivariate generalized Gaussian distributions. Bouguila N. and Fan W. (eds.) *Mixture Models and Applications: Unsupervised and Semi-Supervised Learning*. Cham, Springer.

Conference Publications

Khan, A.I., Al-Badi, A., & Al-Kindi, M. (2019, August). Progressive web application assessment using AHP. Paper Presented at the 16th International Conference on Mobile Systems and Pervasive Computing (MobiSPC), Halifax, Canada.

Al Azawi, R., AlBadi, A., Moghaddas, R. & Westlake, J. (2019, July). *Exploring the potential of using augmented reality and virtual reality for STEM education*. Paper Presented at The 8th International Workshop on Learning Technology for Education in Cloud, Zamora, Spain.

Joe, S.A. (2019, July).*The use of gamification technique in arts development methodology*. Paper Presented at The 8th International Workshop on Learning Technology for Education Challenge, Zamora, Spain.

Halibas, A. S., Al Bulushi, T. A. R. M., Soriano, R. C., & Al Shaqsi, A. S. M. (2019, February). *Ethical design perspectives of intelligent UAVs*. Paper Presented at The 1st International Conference on Unmanned Vehicle Systems-Oman (UVS), Muscat, Sultanate of Oman.

Halibas, A., Cherian, A., Pillai, I., Reazol, J.H., Delvo, E.G., Reazol, L. (2019, January). *Determining the intervening effects of exploratory data analysis and feature engineering in telecoms customer churn modelling*. Paper Presented at The 4th MEC International Conference on Big Data and Smart Cities (ICBDSC 2019), Muscat, Sultanate of Oman.

Halibas, A., Reazol, L., Delvo, E., & Tibudan, J. (2018, November). *Performance analysis of machine learning classifiers for ASD screening using Rapidminer*. Paper Presented at 2018 International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies (31CT 2018), Manama, Kingdom of Bahrain.

Current Research Status

The Following table aims at highlighting the number of journal and conference publications within each faculty. The table shows how research has progressed in Gulf College within the last five years.

Table 1: Number of Journal and Conference Publications at Gulf College

Faculty	Academic Year	Number of Journal Publications	Number of Conference Publications	Total
Centre for Foundation Studies	2018-2019	4	4	8
	2017-2018	4	10	14
	2016-2017	13	10	23
	2015-2016	9	6	15
	2014-2015	3	3	6
Faculty of Business and Management Studies	2018-2019	9	5	14
	2017-2018	0	5	5
	2016-2017	11	3	14
	2015-2016	8	4	12
	2014-2015	6	3	9
Faculty of Computing Sciences	2018-2019	1	6	7
	2017-2018	2	10	12
	2016-2017	5	1	6
	2015-2016	3	7	10
	2014-2015	4	5	9

The following figure aims at providing a more tangible overview on the date presented in Table 1. This figure shows the frequency of journal and conference publications in each faculty/centre per academic year.

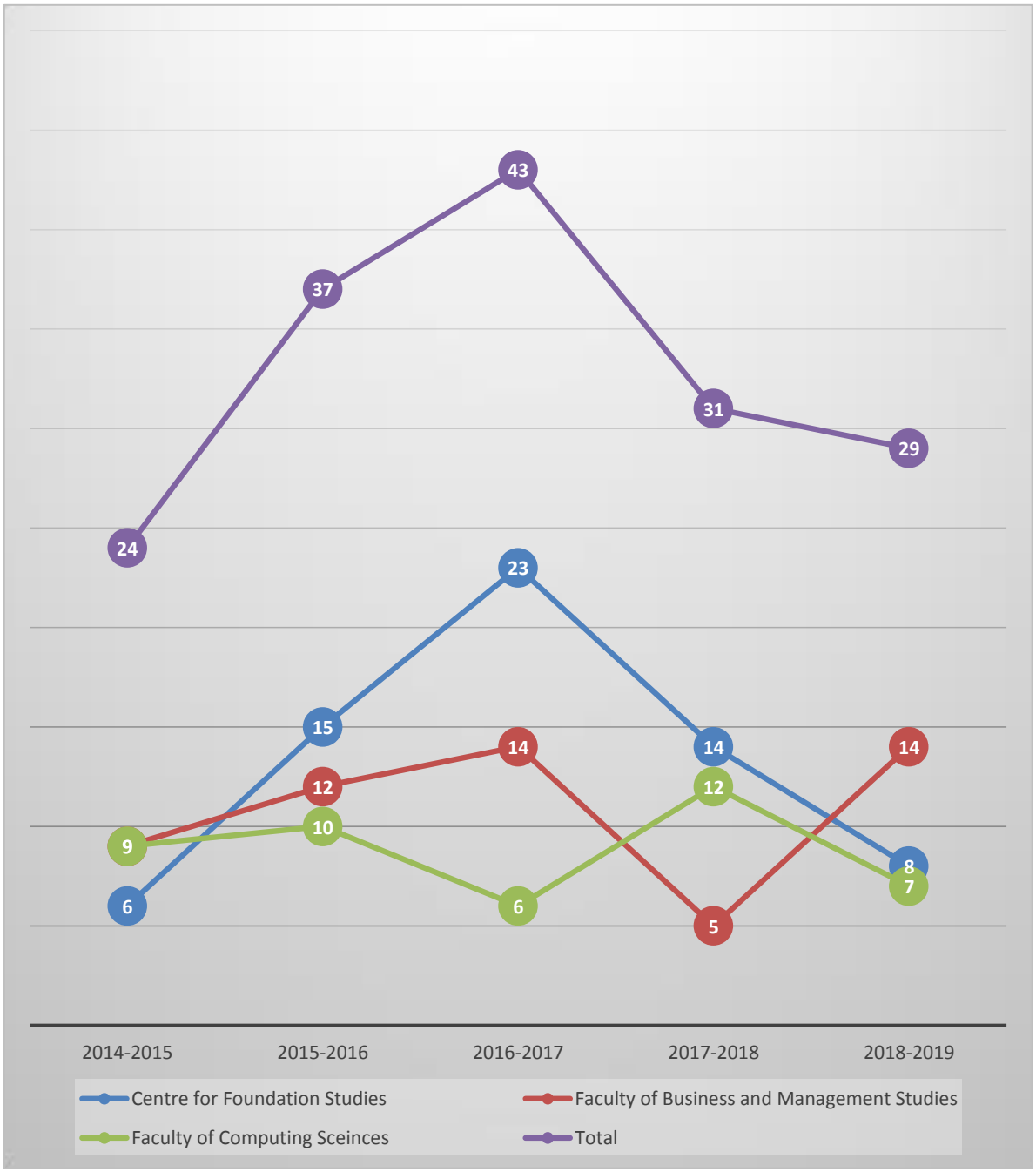

Figure 3: Number of Journal and Conference Publications at Gulf College

Research Workshops

Table 2: List of Research Workshops at Gulf College (Academic Year 2018-2019)

No.	Title of the Workshop	Target Audience	Date
1	Research Progress (as part of Staff General Meeting)	All Staff	29 April 2019
2	Mendeley Software: Add Your References and Citations With Few Clicks	Interested Researchers	25 April 2019
3	A Workshop on Research Funding Schemes (TRC Funds and Internal Grants)	CFS Staff	28 March 2019
4	A Workshop on Research Funding Schemes (TRC Funds and Internal Grants)	FBMS Staff	14 March 2019
5	A Workshop on Research Funding Schemes (TRC Funds and Internal Grants)	FCS Staff	14 March 2019
6	Research Strategic Change at Gulf College	Deanship, Research Committee, Selected Researchers	31 December 2018
7	Research Information management System (RIMS)Awareness Workshop	DDAAR and Research Coordinator	20 December 2018

Research Proposals

The following research proposals have been received by the RD for possible funding under TRC's BFP or IGs. Table 3 shows the list of funded projects by TRC (Call 2018). Table 4 shows the list of proposals submitted to TRC for funding (Call 2019). Finally, Table 5 shows the list of IGs by Gulf College.

Table 3: List of Funded Projects by TRC (Call 2018)

Number	Author(s)	Proposal Title and Abstract
1	PI: Ali Al-Badi, Gulf College, Muscat, Oman Co-PI: Vishal Jain, College of Education, Rustaq, Oman Co-Is: Sujeet K. Sharma, Manisha Sharm, Indian Institute of Management, Tiruchirappalli, India	**Impact of Emerging Technologies in Smart City Solutions in Oman** Internet of Things (IoT), one of the key emerging technologies, has been the result of the sophisticated structure of networks linking millions of million smart devices. IoT is among the most important developments for addressing challenges by creating an artificial global network of interlinked physical objects with hardware, software, detectors and data recovery. The use of emerging technologies, like IoT, big data, artificial intelligence provides the key elements and infrastructure of a 'smart' city. It involves local administration, access to education, medical care, security, construction, transportation and other intelligent utilities. In the smart city, detected data from the virtual world are transposed and then, disseminated in the connected domain, which provides the processed information. In these smart cities, people would be able to implement emerging technologies and that would shift their lifestyle from traditional to digital. Since aforementioned emerging technologies are still in their early development, research in this field of study is limited. This project attempts to understand and predict usage of IoT and other emerging technologies such as big data and artificial intelligence in the aforementioned critical components and services of smart cities in the Sultanate of Oman.
2	PI: Rolou Lyn Maata, Gulf College, Muscat, Oman Co-PI: Alrence S. Halibas, Gulf College, Muscat, Oman Co-Is: Rizwan Ahmed,,	**Building Virtual Communities of Scholars Towards the Improvement of the Research-Teaching Nexus using a Knowledge-based Research Management System** Knowledge management is the process of managing knowledge to maximize organizational learning and

	Gulf College, Muscat, Oman Mohammed Varusai, Gulf College, Muscat, Oman Earl Peter Gangoso, Freelance Researcher Sarah Mae Engcoy, La Salle University, Philadelphia, USA	collective knowledge. Higher Education Institutions (HEIs) recognize that research knowledge is a critical asset that plays a major role in achieving academic excellence. However, some academic institutions have not fully grasped the value of managing research knowledge to improve teaching and learning. Further, little attention is paid in developing an enabling system that will facilitate knowledge management in the Research-Teaching Nexus (RTN). The aims of this research project are to develop a systematic framework and knowledge management system that support virtual communities of scholars towards the improvement of the RTN. This study will primarily assess the current state of practice in knowledge management in the RTN and the findings will be used to develop a conceptual framework and basis for designing a survey questionnaire that will measure the extent and effectiveness in knowledge management in the RTN among HEIs in Oman. The findings of the survey will serve as inputs in the design and development of a Research Knowledge Management System which will be implemented, tested, and evaluated in a selected HEI in Oman. This research will utilize mixed method approaches which include literature review, survey, and document analysis in developing the framework as well as participatory design method and joint application development sessions in developing the system.
3	PI: Alrence Halibas, Gulf College, Muscat, Oman Co-PI: Ali Al Badi, Gulf College, Muscat, Oman Co-Is: Sami Bourouis, Taif University, Taif, Saudi Arabia Muhammad Azam, Concordia university, Montreal, Canada Roobaea Alroobaea, Taif university, Taif, Saudi Arabia Ines Channoufi, University DE Tunis El Manar, Tunis, Tunisia	**Developing an Effective Mixture Machine Learning Model for Improved Image Modelling and Analysis** Precise and accurate modelling and analysis of big data have a variety of applications such as educational data mining, fraud detection, customer segmentation, sales prediction, and preventive healthcare, among others. These are known to be very challenging research problems and have attracted a lot of attention in the data science community. In the medical science industry, for instance, effective analysis of large-scale datasets (i.e. classification, segmentation, and clustering) using advanced techniques derived from the artificial intelligence domain can be very useful for disease diagnosis, prevention, and care. However, these tasks are difficult and proven to be problematic due to various factors like the large datasets, the presence of

		noise, lack of contrast, and the non-homogeneous intensities in several data modalities (e.g. MRI and CT-scans). In this research study, we propose to develop and implement an effective model that utilizes flexible statistical and machine learning approaches to overcome some existing difficulties in image processing. In particular, we aim to develop a mixture machine learning-based model that will improve the performance of image modeling and analysis. It is expected to handle and analyze large scale data and produce a better performance as compared to other existing approaches. The proposed project is foreseen to be promising and able to bring potential benefits in resolving real-world complex problems, most especially in the medical industry.
4	PI: Ronald S. Cordova, Gulf College, Muscat, Oman Co-PI: Rolou Maata, Gulf College, Muscat, Oman Co-I: Ferdinand Epoc, Gulf College, Muscat, Oman Alrence Halibas, Gulf College, Muscat, Oman	**Alumni Tracking Information System (ATIS) Towards the Attainment of Quality Programmes** Alumni are graduates of any higher education institution (HEI) that play a vital role in the attainment of quality education. They are considered as the institution's most valuable asset and serve as the role model to students and to the community. The quality of programmes in higher education institutions (HEIs) in Oman is essential in order to deliver quality education to students. The attainment of quality programmes are influence by various factors such as curriculum design, curriculum review, work placement, human/material resources, and innovation. According to OAAA standards set by quality assurance in higher education, improvement of programmes must have the involvement of relevant stakeholders such as employers, students, teaching staff, professional bodies, and alumni. In Oman, HEIs are facing difficulty in establishing, managing and maintaining connections with alumni and other stakeholders. Hence, the research team decided to come up with an alumni tracking information system that would establish a harmonious relationship between HEI and their alumni. This project aims to design and develop a web-based alumni tracking information system that is highly needed by institutions in Oman in order to meet the requirements of Standard 5 of Oman Academic Accreditation Authority (OAAA) and stakeholders. Based on OAAA Stage 2: Standard 2

		Assessments outcomes, seven (7) out of twelve (12) colleges and universities assessed by OAAA got a score of one (1) which was "partially met". The system has many modules including tracer study that would possibly contribute to the improvement and innovation of quality programmes. This project is not only aligning the institution's strategic directions towards placement and linkages where alumni are deemed as potential stakeholders, but also to transform institution's system into automation and paperless transactions.
5	PI: Marwan Al Share, Gulf College, Muscat, Oman Co-PI: Ali Al Badi, Gulf College, Muscat, Oman Co-I: Sami Bourouis, Taif University, Taif, Saudi Arabia Roobaae Al Roobaea, Taif university, Taif, Saudi Arabia Nizar Bouguila, Concordia university, Montreal, Canada	**Online Human Activity and Facial Expression Recognition Using Efficient Statistical Learning Framework** In this research project, we address the problem of human activity and facial expression recognition which are of great importance for modern society and smart cities applications including human-computer interaction, visual surveillance, robotics, human fall detection, etc. Indeed, the effective recognition and prediction of normal and abnormal human behaviors has become an urgent problem to be solved since it is useful, for example, to help people with disabilities in carrying out their daily tasks, to protect people against crime, to help in developing a therapy system for interpreting autism's expressions, etc. In this research project, we address this problem and our ultimate goal is to extract and model effectively human behaviors using modern and advanced machine learning-based statistical models in order to maximize the recognition rates. The proposed project is promising and has many social, economic and environmental benefits. Form a technological point of view, this project necessitates the collaboration of different but complimentary disciplines such as artificial intelligence, computer vision, machine learning and media management. The hybrid nature (applied and fundamental) of the proposed research project shall provide interesting results that could be used in different other applications such as homeland security.

Table 4: List of Research Proposals Submitted to TRC (Call 2019)

Number	Author(s)	Proposal Title and Abstract
1	PI: Ali Al Badi, Gulf College, Muscat, Oman Co-PI: Rolou Lyn Maata, Gulf College, Muscat, Oman	**Oman's General Foundation Program and National Learning Outcome Standards: Insights From the Computing Element** This study aims at evaluating the effectiveness and efficiency of the General Foundation Programme in the Sultanate of Oman with special reference to its Computing element. This is a pre-requisite program for all undergraduate students at both government and privet colleges and universities in Oman. In doing so, first, ten colleges and universities in the Sultanate of Oman will be selected based on cluster sampling. Then, 20 post-GFP students, 2 post-GFP and 2 GFP faculties will be selected out of each institution. These selections will be based on accidental sampling (N=200 post-GFP students, 20 post-GFP and 20 GFP faculties). An author-designed questionnaire (both fixed-responses and an open-ended question), along with semi-structured interviews will form the instruments of the study. The questionnaire will be based on 5-pint Likert Scale, covering the 6 main components of Computing learning outcomes. In search for statistical differences among the frequencies of students' and faculties responses in this section, the chi-square procedure will be applied. The open-ended question, along with the semi-structured interviews will aim at shedding light upon the qualitative side of the study. These qualitative data will be analysed using NVivo software (2017 version). Finally, a SWOT analysis will be carried out to discuss the findings and results of the study.

2	PI: Hazel Tagalog, Gulf College, Muscat, Oman Co-PI: Alrence Halibas, Gulf College, Muscat, Oman Co-Is: Indu Govinda, Gulf College, Muscat, Oman Anju Matthew, Gulf College, Muscat, Oman Ronald Cordova, Gulf College, Muscat, Oman Bobby Rishikesh, Gulf College, Muscat, Oman	**Evaluating the Academic Advising Programmes of Selected HEIs in Oman: Implications for Policy Restructuring and Improvement** Academic advising is not well established in most HEIs in Oman and there is a lack of consistency in the practice of academic advising. Research studies related to the current practices on academic advising in Oman are limited and are mainly discussed in accreditation reports. Likewise, there is no specific study that examines the needs and preferences of advisors and students in academic advising among the HEIs in Oman. Most of the studies are focused only on measuring the satisfaction and dissatisfaction levels of students. Hence, the main goal of this study is to determine the effectiveness of the current academic advising program of selected HEIs, including Gulf College, as well as review institutional reports and identify best practices. The outcome of this study is intended to inform academic policymakers and managers in developing and improving academic advising. It will provide a clear picture of the expectations of students and teachers so that appropriate policy and procedures are made.
3	PI: Haitham Adarbah, Gulf College, Muscat, Oman Co-PI: Ali Al Badi, Gulf College, Muscat, Oman Co-I: Shakeel Ahmed, Solent University, Southampton, UK	**Design and Development of Context-Aware Secure RPL Routing Protocol for the Internet of Things** The huge data acquisition in the IoT (Internet of Things) systems makes the data transportation and routing a massive challenge. One of the common routing protocols in IoT networks is RPL (Routing Protocol for Low- power and Lossy Networks), but it is prone to a number of attacks. This research project will propose a new context-aware secure routing protocol based on RPL. The main aim of this research is to develop a context-aware secure RPL object function in order to detect and isolate malicious nodes while enhancing network performance. The concept of context-aware computing techniques to deal with attacks on RPL-based IoT systems will be introduced. The suggested scheme will be implemented in the Cooja simulator for performance evaluation and analysis. The simulation results will be then verified in real-world experiments using testbeds.
4	Faculty Mentor: Nasrin Sulthana, Gulf College, Muscat, Oman	**4 p's to 4E's – How to avoid the risk of unbalancing Marketing Mix to bring development in tourism in Oman**

	Team Leader: Samya Salim Said AL Dugashy (Student ID: 1710335) Other Members: Yousuf Mohammed Salim Al Rashdi (Student ID: 1710671) Nawaf Darwish Fairiya Al Bulushi (Student ID: 1610459) Salma Ibrahim Mohammed Al Bulushi (Student ID: 1610347)	In the new dynamics' of 21st century and the world with full of competitive environment it need to bring growth in the field of tourism in Oman which need to adopt new strategies. For that the tourism sector in Oman need bring growth in its marketing strategies. Oman's economy is set to accelerate in 2019, with experts, surveys, and GDP growth forecasts all indicating another banner year for the country's development. A number of economic indicators have predicted Oman's GDP growing by 3.5 per cent, higher than the initial forecast of 2.5 per cent earlier this year. Additionally, with the nation's deficit continuing to fall, revenue is expected to contribute even more significantly to job creation, industrialisation, and government revenues (Times of Oman, 2018). Tourism in particularly need to change its scenario to increase the GDP of the country. The tourists were on of the main source of income to increase the economy of the country. The marketing mix 4 p's were focused on the growth of the tourism. But as per the need of this hour the trends were changing and the tourism need to adopt 4 E's.
5	PI: Alrence Halibas, Gulf College, Muscat, Oman Co-PI: Shameena Mehtab, Gulf College, Muscat, Oman Co-I: Maria E.L.T. Cruz, University of Nizwa, Nizwa, Oman Benjamin Alo, Gulf College, Muscat, Oman Alaa Ismat Al Attil, Gulf College, Muscat, Oman Ronald Cordova, Gulf College, Muscat, Oman	**Embedding Graduate Attributes and Assessing Learning Outcomes: An HEI Roadmap** This study will describe the roadmap on how one HEI in Oman developed, implemented, and assessed the achievement of the graduate attributes. Specifically, this study will conduct content analysis of publicly-available OAAA audit reports of HEIs in Oman, describe the approaches and techniques that are employed in developing the graduate attributes and its associated assessment framework. It will consider the outcomes of the various qualitative and quantitative analyses, benchmarking, and multi-stakeholders consultations, as well as report the student achievement of graduate attributes and learning outcomes at various levels of assessment. Furthermore, this study will develop an automated tool in assessing the GAs and LOs, institutional, programme, and module wise. The outcomes of this study will help other HEIs in enhancing their programme and policy-making related to the graduate attributes and learning outcomes. It will also provide academic managers with the techniques and strategies to assess graduate attributes and learning outcomes at different academic levels.

6	PI: Sebastin Antony Joe, Gulf College, Muscat, Oman Co-PI: Ronald Cordova, Gulf College, Muscat, Oman Co-I: Haydar Kalash, Gulf College, Muscat, Oman	**Smart Campus in Higher Education Institutions using the Internet of Things** The concept of a SMART Campus has been here for a long time and a lot of work is still in progress to facilitate teaching and learning environment in a more productive and intuitive way. The smartness did not limit itself into a single classroom rather it extended itself to make the whole institute SMART by automating facilities in excess to the individual entity. This move gained much pace by the introduction of IoT. In a SMART campus, we will adopt some of the features that we can find in a smart city along with a paper-free and eco-friendly campus. These IoT features are integrated along with the current campus facilities. These features will help Higher Education Institutions to manage the campus efficiently and effectively. The features that will be implemented in the Smart campus are Smart Attendance System, Smart Equipment Management System, and Smart Green Environment System along with fire and safety. The project will monitor energy and environment; it will also monitor the staff and students attendance. The actual things that the project will do are the deployment of a Smart room (monitor electricity, AC, temperature, attendance, occupancy(the room is available or not), Smart education, automated system for watering plants and automated fire alarm system.

Table 5: List of Internal Grants by Gulf College

Number	Author(s)	Proposal Title and Abstract
1	PI: Peyman Nouraey, Gulf College, Muscat, Oman Co-PI: Jenna Engelhart, Gulf College, Muscat, Oman	**Evaluating General Foundation Program in Oman through Kirkpatrick's Four Level Model** The present study aims at evaluating the effectiveness and efficiency of the General Foundation Programme in the Sultanate of Oman. This is a pre-requisite program for all undergraduate students at both government and privet colleges and universities in Oman. The researchers will utilise Kirkpatrick's (2007) Four Level Model of program evaluation, consisting of four main elements spread over the evaluation of reaction, learning, behavior, and result. These factors determine whether an educational programme is on the right track or not. In doing so, various factors and components of the programme undergo a thorough evaluation; some examples may include the evaluation of curriculum, homework, learning facilities, classroom environment, program content and value, level of learning, skills, change in students' behavior, etc. Two-hundred GFP students along with ten GFP teaching faculties will form the participants of the study. Both selections will be based on accidental sampling. An author-designed questionnaire (both fixed-responses and an open-ended question), along with semi-structured interviews will form the instruments of the study. The questionnaire will be based on 5-pint Likert Scale, covering the main elements of the model in question. In search for statistical differences among the frequencies of students' responses in this section, the chi-square procedure will be applied. The open-ended question, along with the semi-structured interviews will aim at shedding light upon the qualitative side of the study. These qualitative data will be analysed using NVivo software (2017 version). Finally, a SWOT analysis will be carried out to discuss the findings and results of the study.

Research Forms[1]

To speed up the process of applications and approvals related to research, the RD has created new forms, listed as below:

Table 6: List of Research Forms

Form Code	Form Title
RF1	Research Proposal
RF2	Personal Data Form
RF3	Proposal Evaluation Form
RF4	Research Progress Report
RF5	Fund Allocation Form (Journal Publication)
RF6	Fund Allocation Form (Conference Publication)
RF7	Conference Presentation Report Form
RF8	Research Employment Contract
RF9	Research Employee Payment Form
RF10	Intellectual Property Disclosure Form
RF11	Petty Cash Request Form
RF12	Petty Cash Follow Up Form
RF13	Procurement Request Form

[1] Forms are electronically available on the College website at https://gulfcollege.edu.om/research-centre/research-forms/


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