

Shortfalls in SAR-Revised

- Discussion of Performa 1 and 10 missing- **Done**
- Performa 8 data missing- **Done**
- **Summary to make a bit different**
- Performa 2 missing- **Done**
- Performa 7 missing- **Done**

PirMehr Ali Shah

Arid Agriculture University Rawalpindi



Self Assessment Report
4th Cycle (Fall2012-Spring 2014)
M.Sc. Wildlife Management

Department of Wildlife Management

Prepared by: 1. Prof.Dr. Maqsood Anwar (Coordinator)
 2. Dr. Tariq Mahmood(Member)
 3. Dr. Muhammad Rais (Member)

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INTRODUCTION

The Department of Wildlife Management at PirMehr Ali Shah Arid Agriculture University Rawalpindi was established in 2007 with a mandate to carry out teaching and research on various aspects of wildlife, suggesting measures for conservation of wildlife populations and their habitat, especially focusing on threatened species, management of protected areas and wetlands, and management of human-wildlife conflict. The department is offering postgraduate degrees of M.Sc., M.Phil. and Ph.D. in wildlife management. The students' enrollment in M.Sc. programme was 21 during the reporting period. The faculty members and students of this department have published more than 40 research papers (as senior author or co-author) during the last two years.

An extensive scheme of study (consisting of 32 courses) has been developed for post graduate degree programme in the field of wildlife management including all major aspects such as wildlife study techniques, wildlife population, management, diseases and captive breeding, management of protected area, wetlands and terrestrial habitats, wildlife policy, laws, conservation strategies and conventions, wildlife damage management, threatened species management, illegal trade, etc. The courses are supported by latest text books and research publications.

Presently, the research studies conducted by the students and faculty focus on population density and size, wildlife habitat analysis, evaluation and preference, food habits and diet composition, breeding habits and breeding biology, distribution of wildlife species in their habitat, baseline data on protected areas and threatened species, wetland ecology, population size and trends of water birds, threats to wildlife species, etc. In future, the department would address major issues on wildlife population, habitat and threats, developing strategies for their conservation and environmental education/awareness among the public.

The research facilities have been established both for the field as well as laboratory. Necessary field equipments required for conducting wildlife research studies have been procured under HEC funded development and research projects as well as university funded research projects. This includes; live traps, nets, binoculars, spotting scopes, cameras, GPS, camping gear, glassware, refrigerators, ovens, deep freezers, chemicals, etc.

The faculty members implemented seven research projects during reporting period which included; i) "Baseline studies on wildlife diversity in selected protected areas of Pakistan-Phase-II funded by HEC for a period of three years (2014-17), amounting to Rs. 3,916,555.00, ii) "Ecology of Indian pangolin (*Manis crassicaudata*) in Potohar region" funded by HEC amounting to Rs. 2.158 m was completed during the report period. iii) "Spatial distribution of habitats influences anuran diversity and space use in the landscape: implications for conservation beyond species level" funded by International Foundation for

Science, Sweden (2013-2016) amounting to US\$12,000/-, iv) “Ecology and conservation of soft-shell turtles (Family Trionychidae) in North Punjab, Pakistan” (2013-2016) funded by Idea Wild for US\$ 1000/-, v) “Establishment of Aviary Facility for Captivity Breeding of Fancy Birds (2014 Completed) funded by PMAS-AAUR amounting to Rs. 150,000/-, vi) “Establishment of Aviary Facility for Captivity Breeding of Wild Birds” (2014 Completed) funded by PMAS-AAUR amounting to Rs. 150,000/- and vii) “Evaluation of acrosomal status of Red Jungle Fowl spermatozoa with bright field, phase contrast and differential interference contrast microscopy” (2012-13 completed) funded by PMAS-AAUR amounting to Rs. 0.133 m.

More than 270 books related to wildlife ecology, management and conservation are available in the departmental library, in addition to several books in university library for ready reference to the students. In addition, students are encouraged to get electronic copies of latest research papers related with their area of research by contacting relevant authors, institutions, publishers, etc.

This Self Assessment Report (SAR) is based on eight criteria. The first criterion outlines the program mission and objectives. Criterion 2 provides information about the curriculum development. Criterion 3 enlists the laboratories and other relevant information. The fourth criterion is pertinent to the information about students' support and advising. The last four criteria provide information about process control, faculty characteristics and institutional facilities and support.

CRITERION 1: PROGRAM MISSION, OBJECTIVES AND OUTCOMES

Standard 1.1. The program must have measurable objectives to support Mission

Mission Statement: To deliver quality education on various aspects of wildlife and its habitat including ecology, biology, research and management for its conservation.

Objectives:

1. To impart education and training to students in wildlife science /research to make them able to understand and address the issues related to wildlife management.
2. To impart conservation education and awareness about wildlife resources of Pakistan.

Main elements of strategic plan to achieve mission and objectives:

- Development of sound teaching baseline from latest available literature, reviews, field experiences, symposia, workshops, etc. for the award of degree.
- Designing of curricula including core subjects, elective subjects and study tours.
- Setting up laboratories for the students; depending upon the available resources.
- Arranging study tours to impart first-hand knowledge to students about wildlife identification and management.
- Development of scientific writing and presentation skills through assignments and research reports.

The assessment of the program objectives through different criteria is presented in Table 1

Table 1. Program Objectives Assessment

S. #	Objective	How Measured	When Measured	Improvement Identified	Improvement made
1	To impart education and training to students in the field of wildlife science to make them able to understand and address the issues related to wildlife management.	Knowledge of students about the subject through exams and students feedback from assessment proformas	During the semesters' examinations	Courses to be updated regularly by inducting new knowledge/ techniques & also induct new courses	Revision of curriculum and induction of new courses.
2	To impart conservation education and awareness about wildlife resources of Pakistan	Assessing students knowledge through quizzes, papers, assignments	During mid, final exams, presentation of assignments, field visits	Updating contents of courses and induct new courses	Revision of curriculum and induction of new courses.

PROGRAM LEARNING OUTCOMES

Students of M.Sc. should possess the ability of:

- Identification of wildlife species, their habitats and distribution in Pakistan
- Identification of wildlife management issues and suggest appropriate solutions

- Scientific writing and communication skills through presentations, oral discussions, scientific reports, etc.

Questionnaire surveys were conducted to assess program outcomes of the department / graduates for M.Sc. (Table 2).

Table 2. Relationship of Program Objectives with Program Outcomes

Program Objectives	Program Outcomes		
	Wildlife species identification skills	Problem solving / management skills	Scientific writing & communication skills
Wildlife management	+++	++	++
Conservation education/ awareness	++	+	++

+ = Moderately satisfactory

++ = Satisfactory

+++ = Highly satisfactory

PROGRAM ASSESSMENT RESULTS:

Teacher's Evaluation

Four teachers of the department teach classes to M.Sc. students namely:

1. Dr. Iftikhar Hussain Professor
2. Dr. Tariq Mahmood Assistant Professor
3. Dr. Muhammad Rais Assistant Professor
4. Ms. Bushra Allah Rakha Lecturer

The teachers were evaluated by the students at the end of course completion through Proforma-10. Detail of performance of each teacher is given in Figs. 1-13.

WL-701

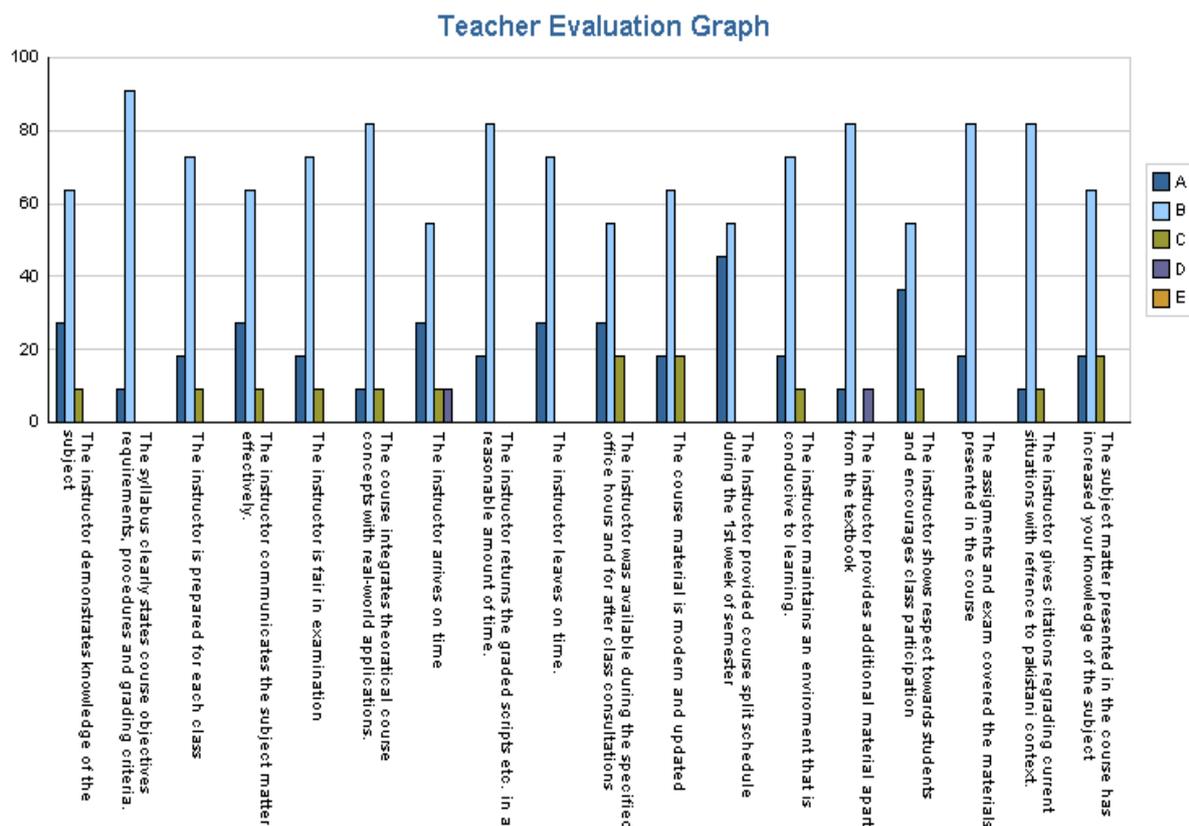


Figure 1. Teacher’s evaluation for WL-701 during Fall-2013.

Discussion:

The majority of the students were satisfied regarding the instructor’s abilities, method of teaching, lecture preparedness, availability, punctuality, behavior and attitude and provision of course material.

WL-702

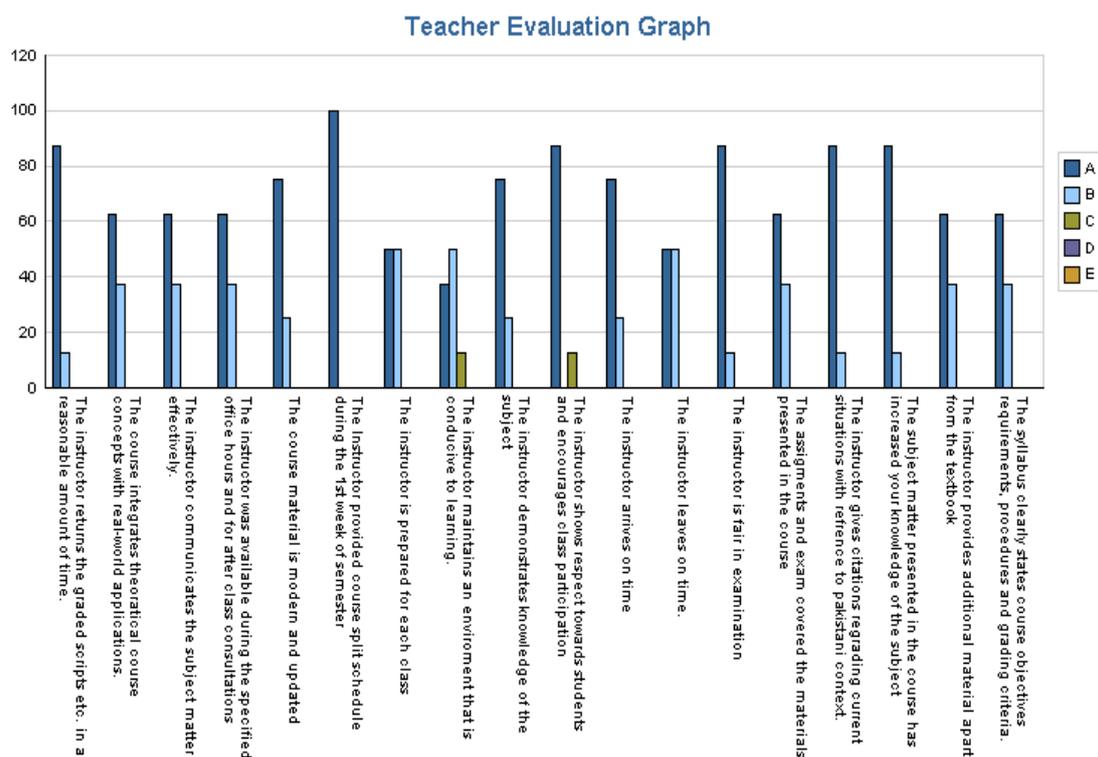


Figure 2. Teacher Evaluation for WL-702 during Fall-2013

Discussion:

The majority of the students were satisfied regarding the instructor's abilities, method of teaching, lecture preparedness, availability, punctuality, behavior and attitude and provision of course material.

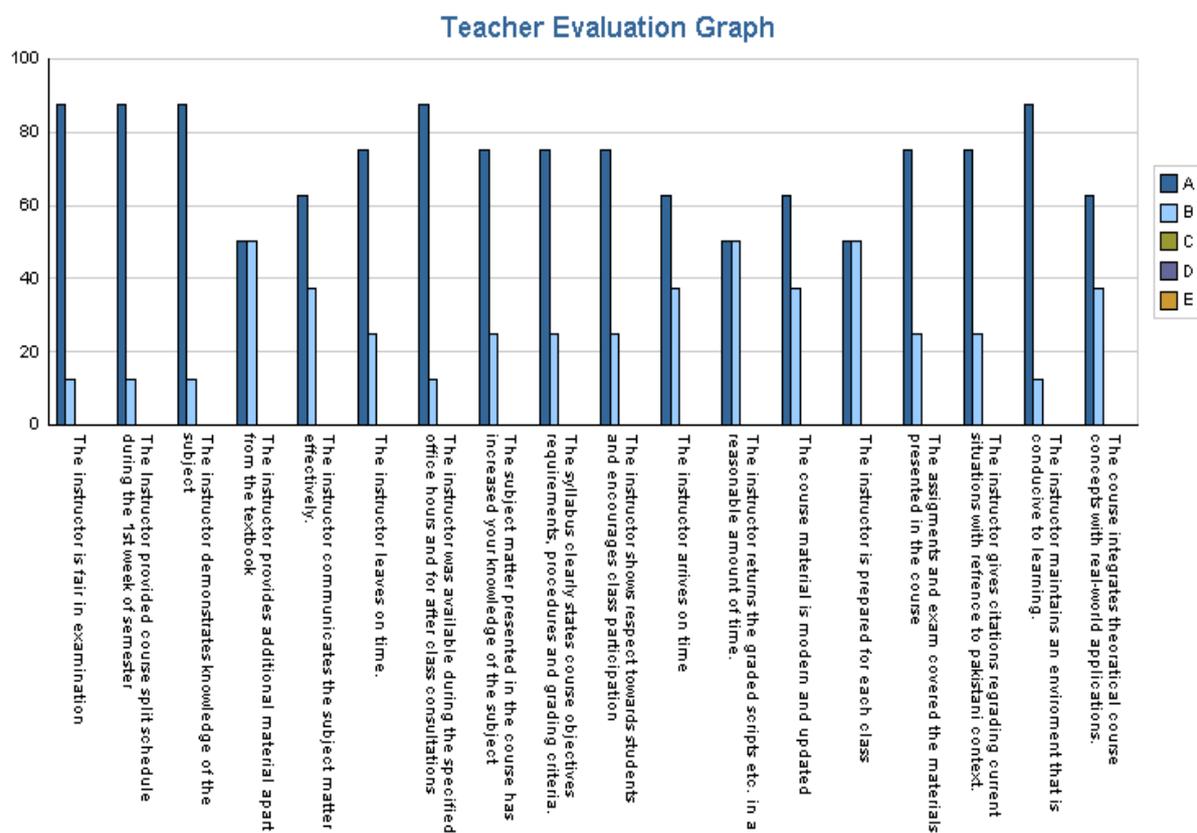


Figure 3. Teacher Evaluation for WL-706 during Fall-2013

Discussion:

The majority of the students were satisfied regarding the instructor’s abilities, method of teaching, lecture preparedness, availability, punctuality, behavior and attitude and provision of course material. The students did not give any negative feedback on any of the question asked.

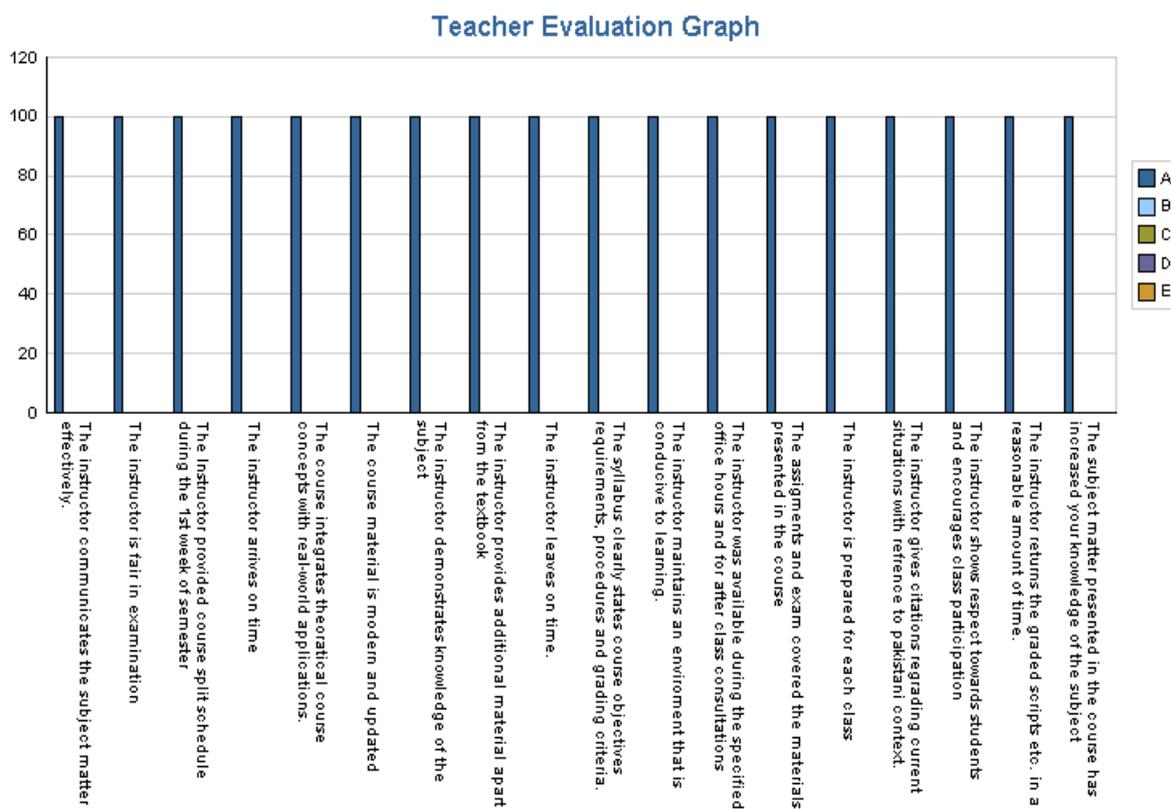


Figure 4. Teacher Evaluation for WL-707 during spring 2013

Discussion:

All students showed satisfaction about the instructor’s abilities, method of teaching, lecture preparedness, availability, punctuality, behavior and attitude and provision of course material.

WL-708

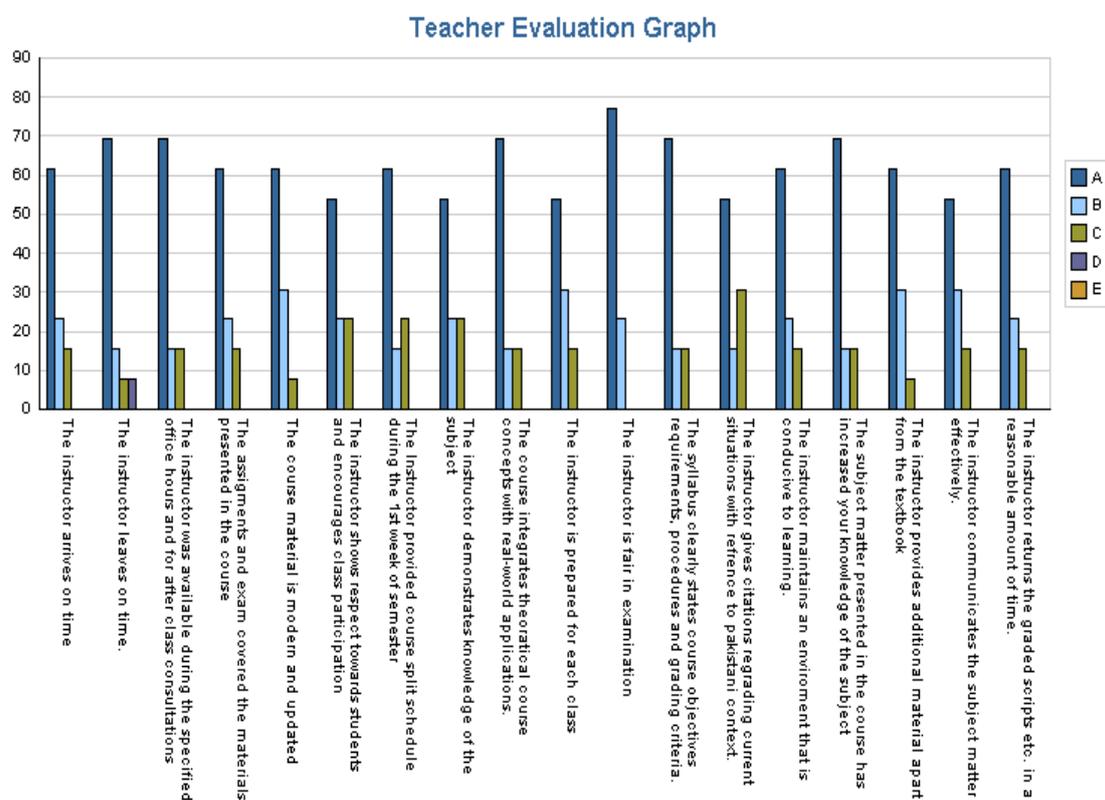


Figure 5.Teacher Evaluation for WL-708 during Spring-2014.

Discussion:

The majority of the students were satisfied regarding the instructor's abilities, method of teaching, lecture preparedness, availability, punctuality, behavior and attitude and provision of course material.

WL-709

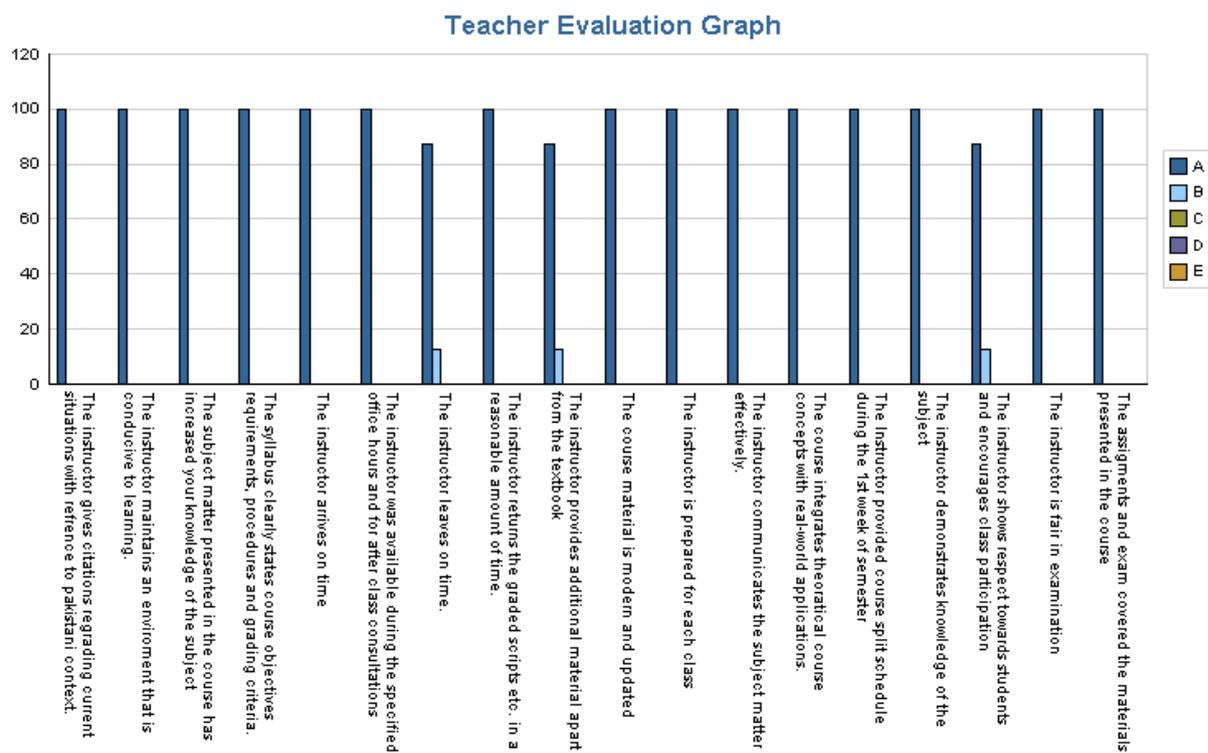


Figure 6. Teacher Evaluation for WL-709 during Spring-2014

Discussion:

All students were satisfied regarding the instructor's abilities, method of teaching, lecture preparedness, availability, punctuality, behavior and attitude and provision of course material.

WL-711

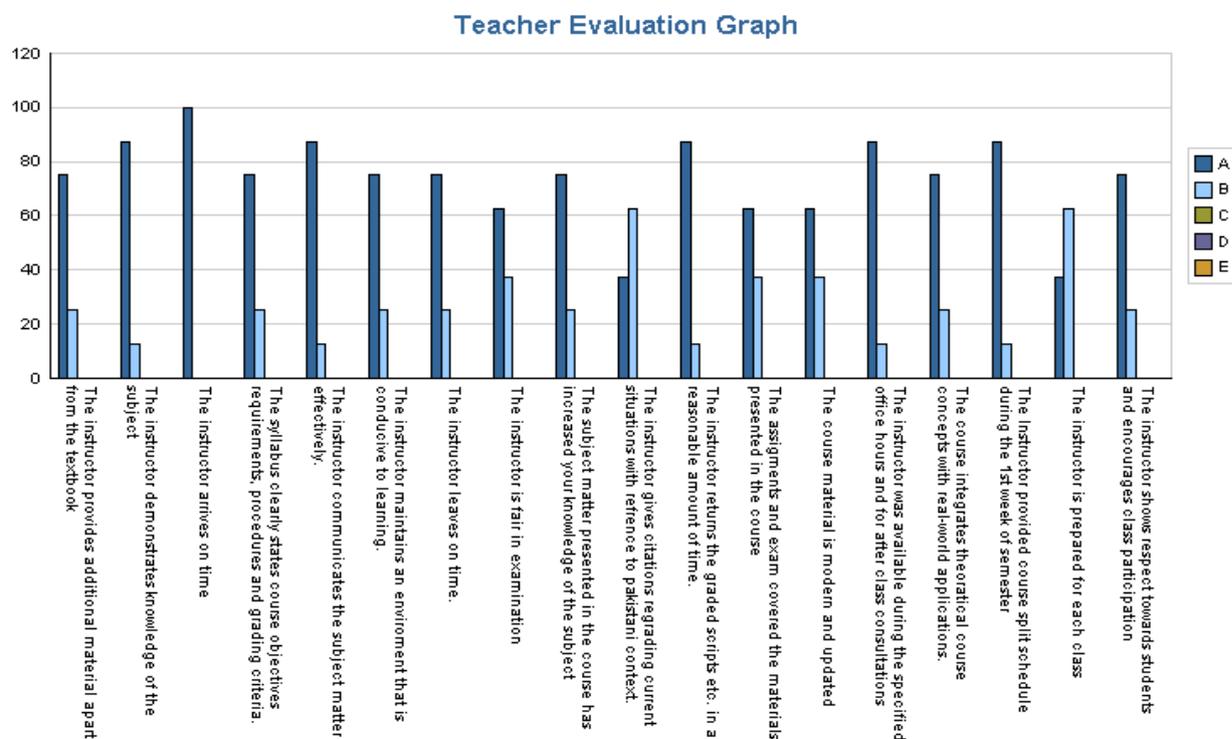


Figure 7. Teacher Evaluation for WL-711 during Fall-2013

Discussion:

The majority of the students were satisfied regarding the instructor's abilities, method of teaching, lecture preparedness, availability, punctuality, behavior and attitude and provision of course material.

WL-712

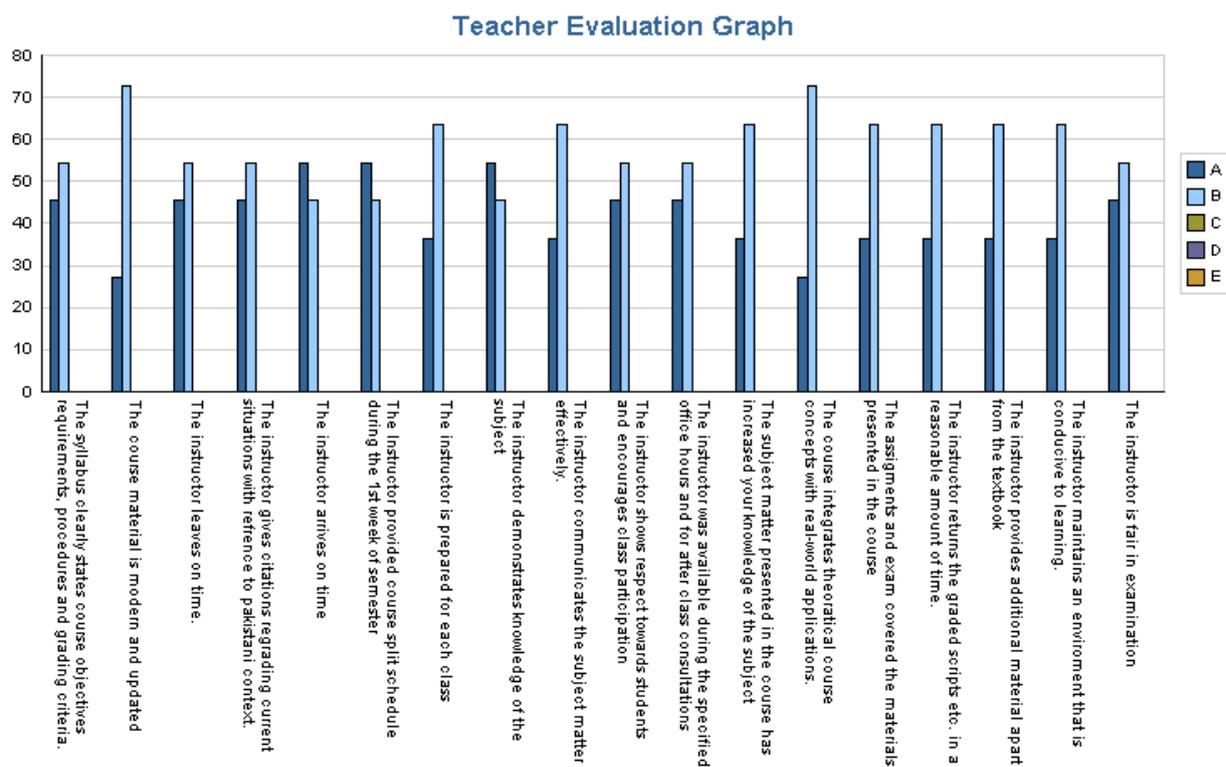


Figure 8. Teacher Evaluation for WL-712 during Fall-2013

Discussion:

All students were satisfied regarding the instructor's abilities, method of teaching, lecture preparedness, availability, punctuality, behavior and attitude and provision of course material. None of the questions asked received negative feedback.

WL-714

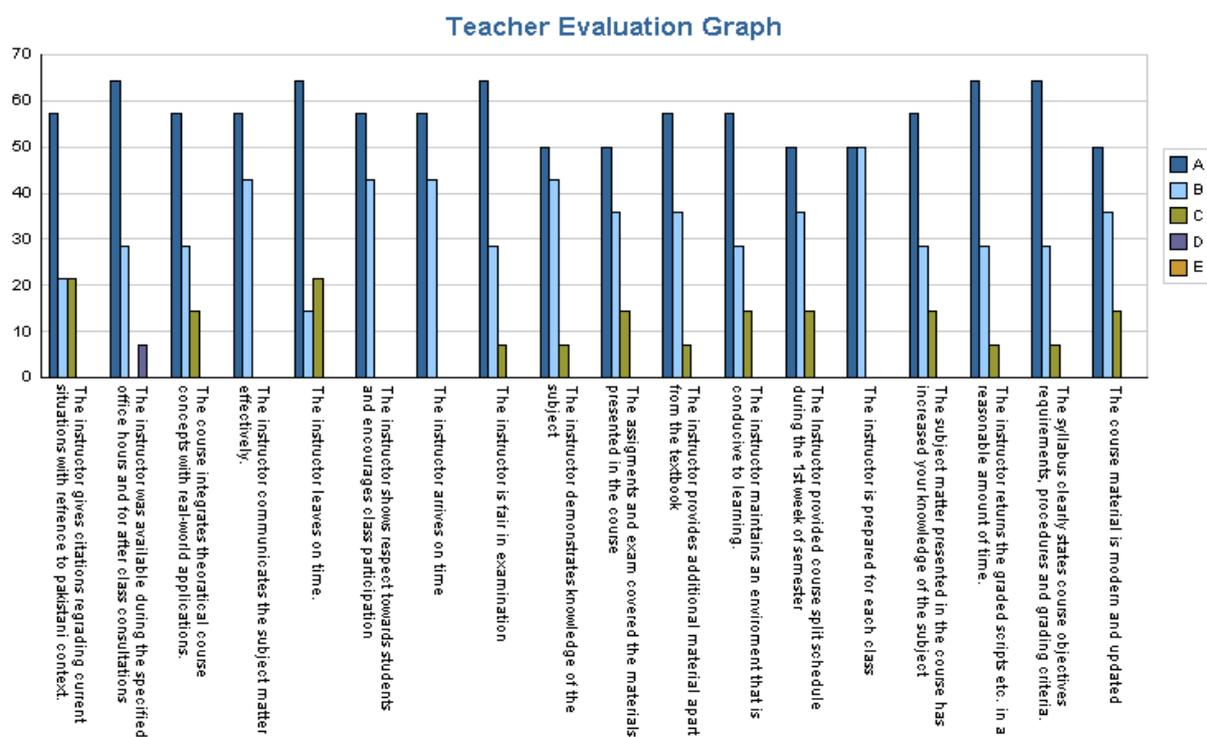


Figure 9. Teacher Evaluation for WL-714 during spring 2014

Discussion:

The majority of the students were satisfied regarding the instructor's abilities, method of teaching, lecture preparedness, availability, behavior and attitude. Only few students showed dissatisfaction over punctuality of the instructor, provision of course material and content of the course in relation to current situations in Pakistan.

WL-716

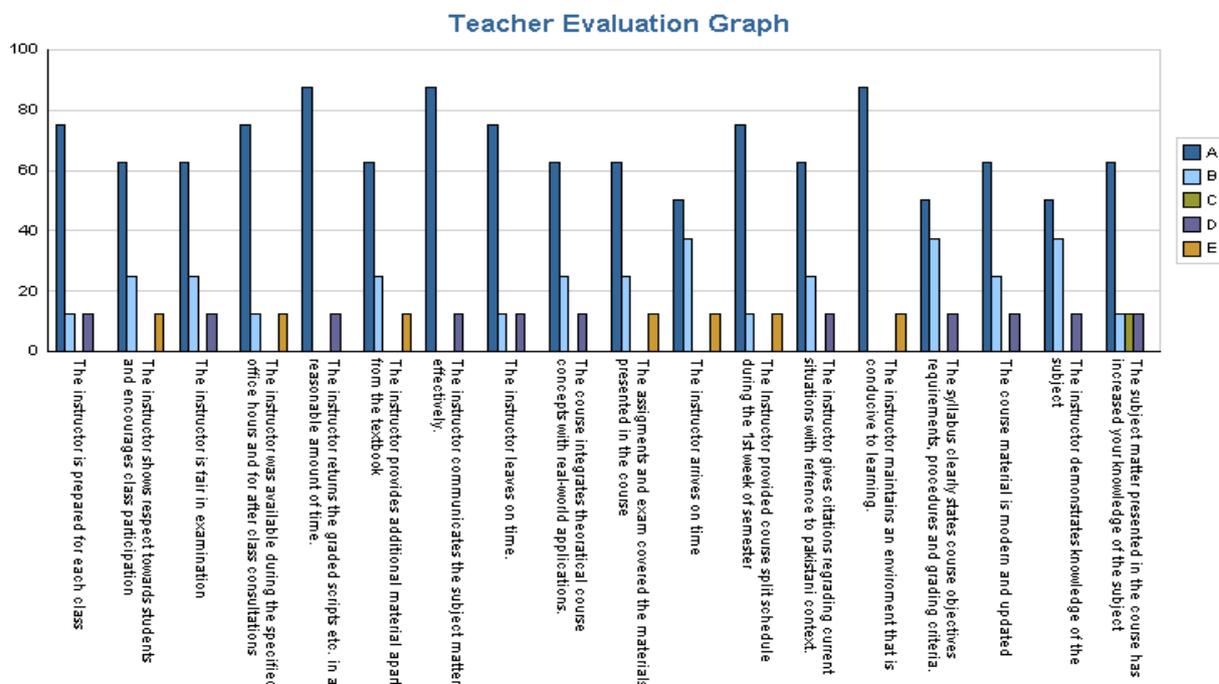


Figure 10. Teacher Evaluation for WL-716 during Fall-2013

Discussion:

The majority of the students were satisfied regarding the instructor's abilities, method of teaching, lecture preparedness, availability, punctuality, behavior and attitude and provision of course material.

WL-718

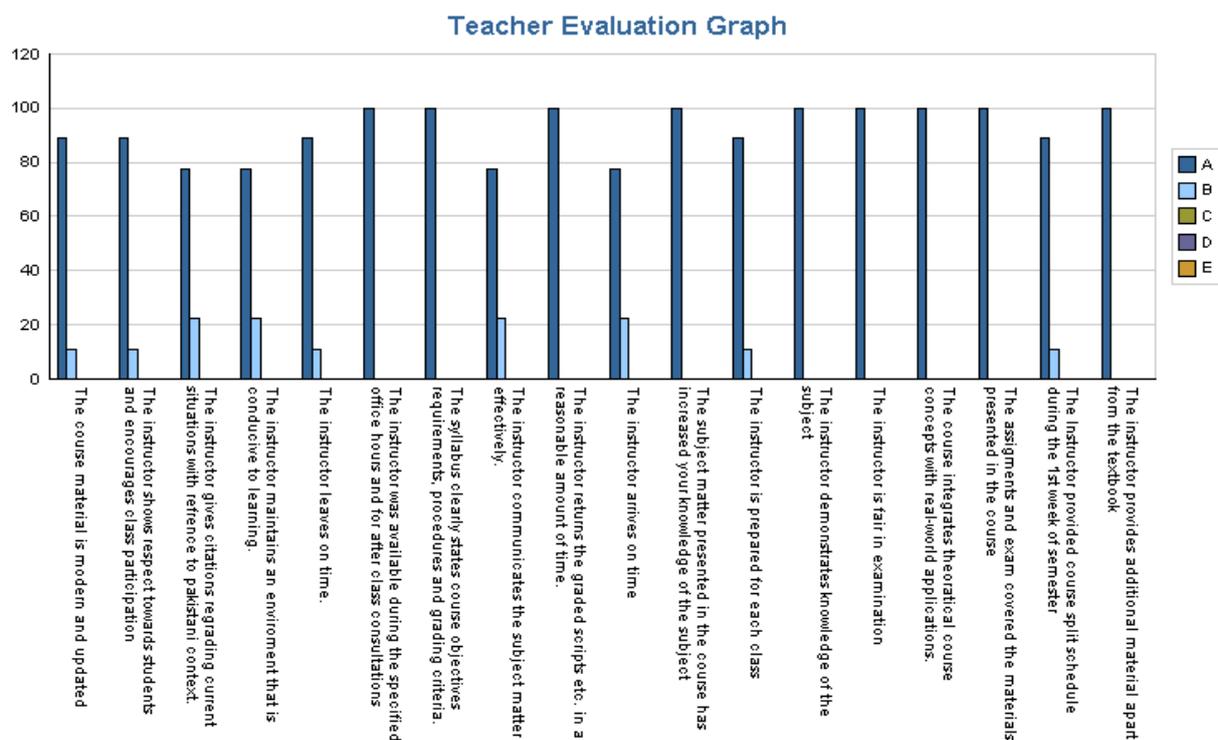


Figure 11. Teacher Evaluation for WL-718 during Spring-2013

Discussion:

The majority of the students were satisfied regarding the instructor's abilities, method of teaching, lecture preparedness, availability, punctuality, behavior and attitude and provision of course material. No negative feedback was received.

WL-726

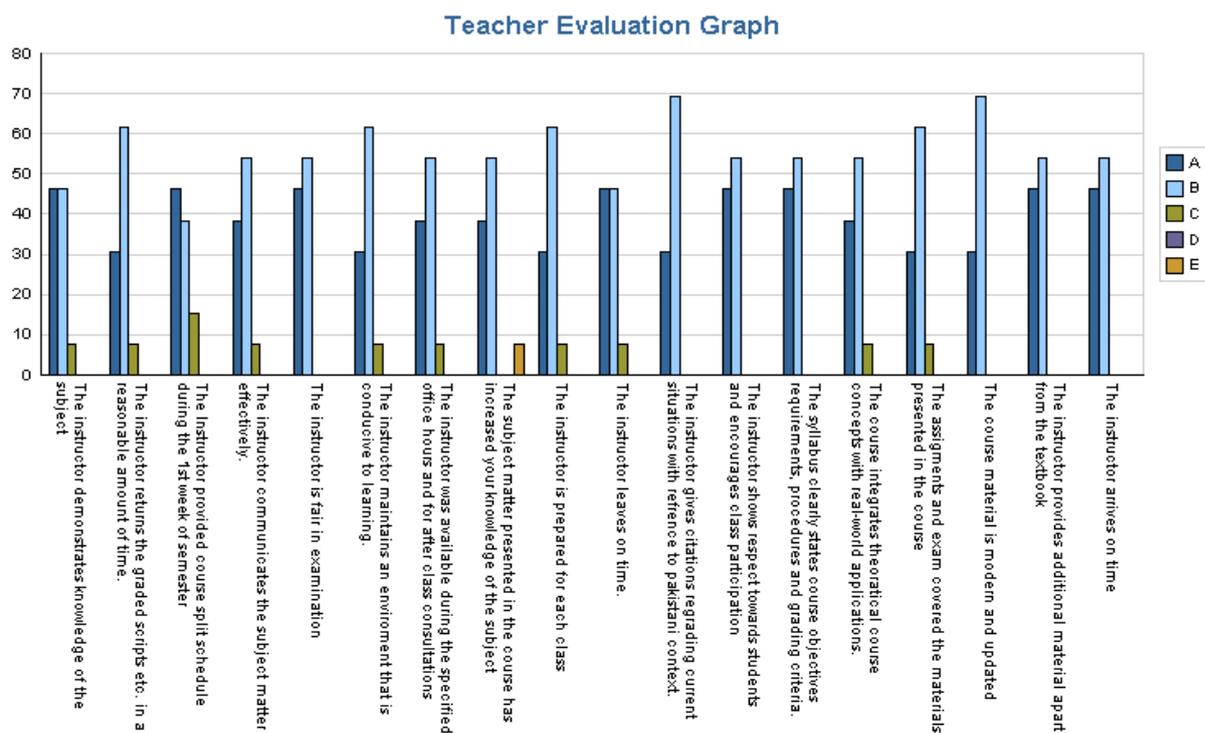


Figure 12. Teacher Evaluation for WL-726 during Fall-2013

Discussion:

The majority of the students were satisfied regarding the instructor's abilities, method of teaching, lecture preparedness, availability, punctuality, behavior and attitude and provision of course material.

WL-729

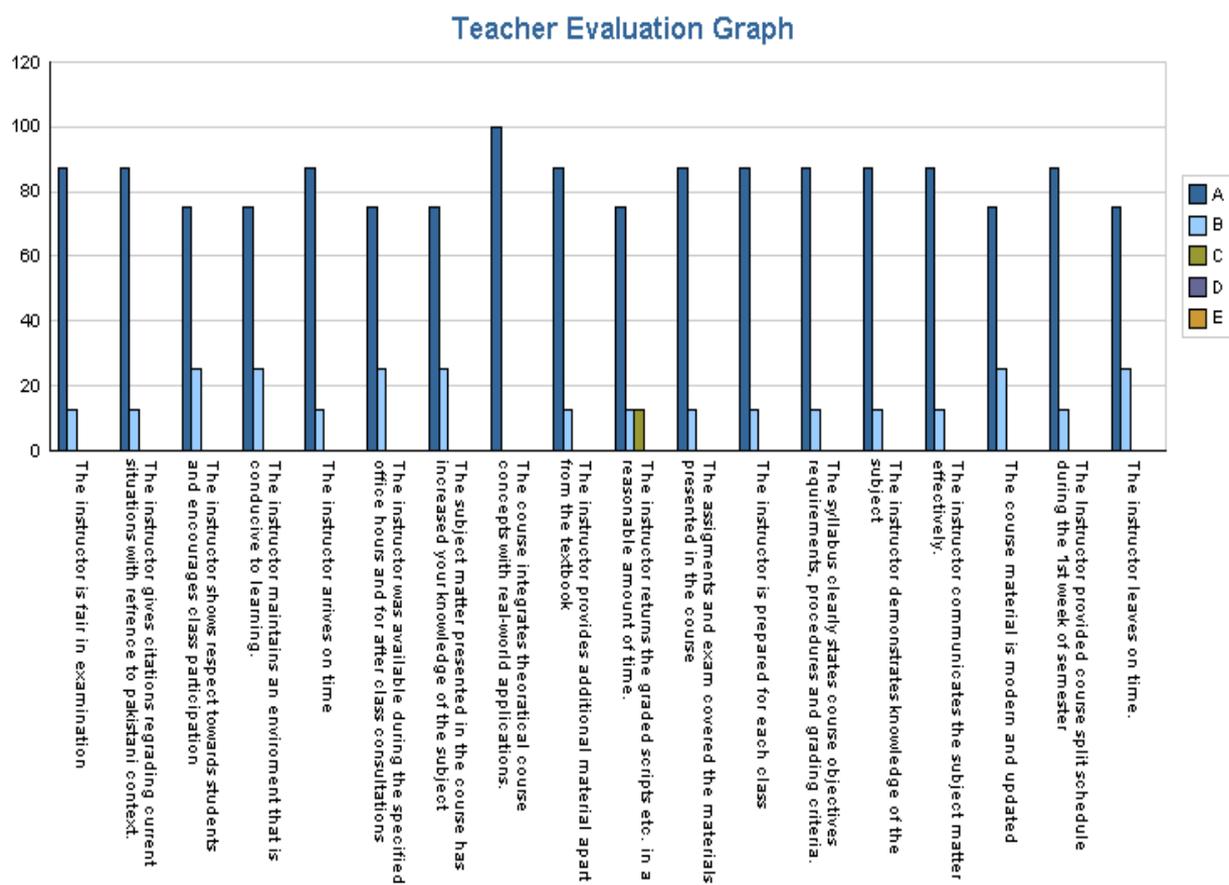


Figure 13. Teacher Evaluation for WL-729 during Spring 2014

Discussion:

The majority of the students were satisfied regarding the instructor’s abilities, method of teaching, lecture preparedness, availability, punctuality, behavior and attitude and provision of course material.

Course Evaluation

The Courses offered during the report period (Table-3) were evaluated by the students at the end of course completion through **proforma-1**. Detail of evaluation of each course is given in Figs. 14-26.

Table 3. Courses offered and evaluated during Fall 2012 to Spring 2014

#	Code	Course Title	Semester	Teacher
1	WL-701	An introduction to wildlife of Pakistan	Fall 2012 + Fall 2013	Bushra Allah Rakha
2	WL-702	Wildlife Population Ecology	Fall 2012 + Fall 2013	Dr. Tariq Mahmood/ Dr. Iftikhar Hussain
3	WL-706	Wildlife Management at Wetlands	Fall 2012 + Fall 2013	Bushra Allah Rakha
4	WL-707	Terrestrial Wildlife Management	Spring 2013 + Spring 2014	Muhammad Rais
5	WL-708	Wildlife damage management	Spring 2013 + Spring 2014	Dr. Iftikhar Hussain
6	WL-709	Society, values and economics of wildlife	Spring 2013 + Spring 2014	Dr. Maqsood Anwar/ Dr. Tariq Mahmood
7	WL-711	Research planning and report writing	Fall 2012 + Fall 2013	Dr. Iftikhar Hussain
8	WL-712	Conservation biology of wildlife	Fall 2012 + Fall 2013	Muhammad Rais
9	WL-714	Reproductive Biology and Breeding	Fall 2012 + Spring 2014	Bushra Allah Rakha
10	WL-716	Wild Fish Fauna of Pakistan	Fall 2012 + Fall 2013	Bushra Allah Rakha
11	WL-718	Captive wildlife management	Spring 2013 + Spring 2014	Bushra Allah Rakha
12	WL-726	Essentials of wildlife conservation- National Perspective	Fall 2012 + Fall 2013	Dr. Maqsood Anwar
13	WL-729	Biology and conservation of amphibians and reptiles	Spring 2013 + Spring 2014	Muhammad Rais

WL 701

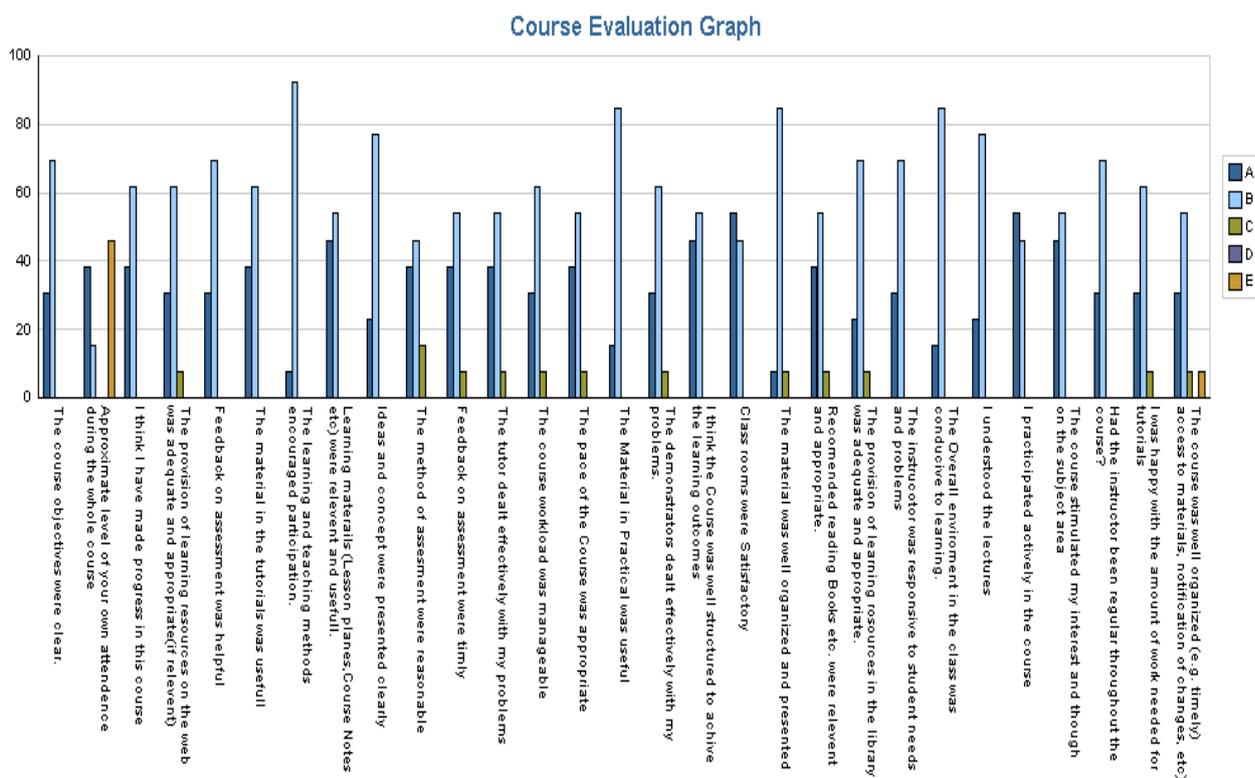


Figure 14. Course Evaluation of WL-701 during Fall-2013

Discussion:

The majority of the students were satisfied and termed the course interesting, well organized, with clear objectives. The students were satisfied with the pace of the course during the semester, provision of learning resources and feedback on assignment timely and helpful. The students thought that the instructor was punctual and was helpful in solving the problems. Few students were unsatisfied with the conditions of classrooms.

WL-702

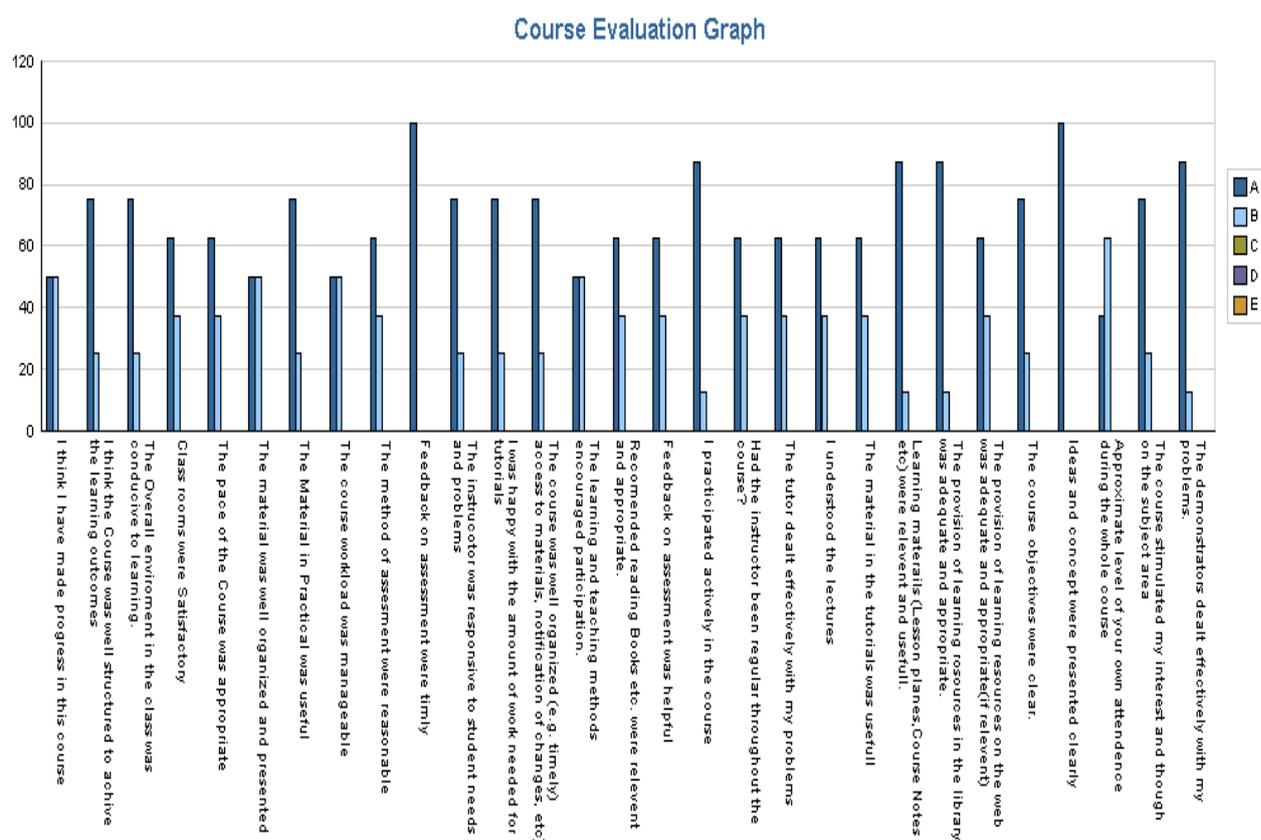


Figure 15. Course Evaluation of WL-702 during Fall-2013

Discussion:

The majority of the students were satisfied and termed the course interesting, well organized, with clear objectives. The students were satisfied with the pace of the course during the semester, provision of learning resources and feedback on assignment timely and helpful. The students thought that the instructor was punctual and was helpful in solving the problems.

WL-706

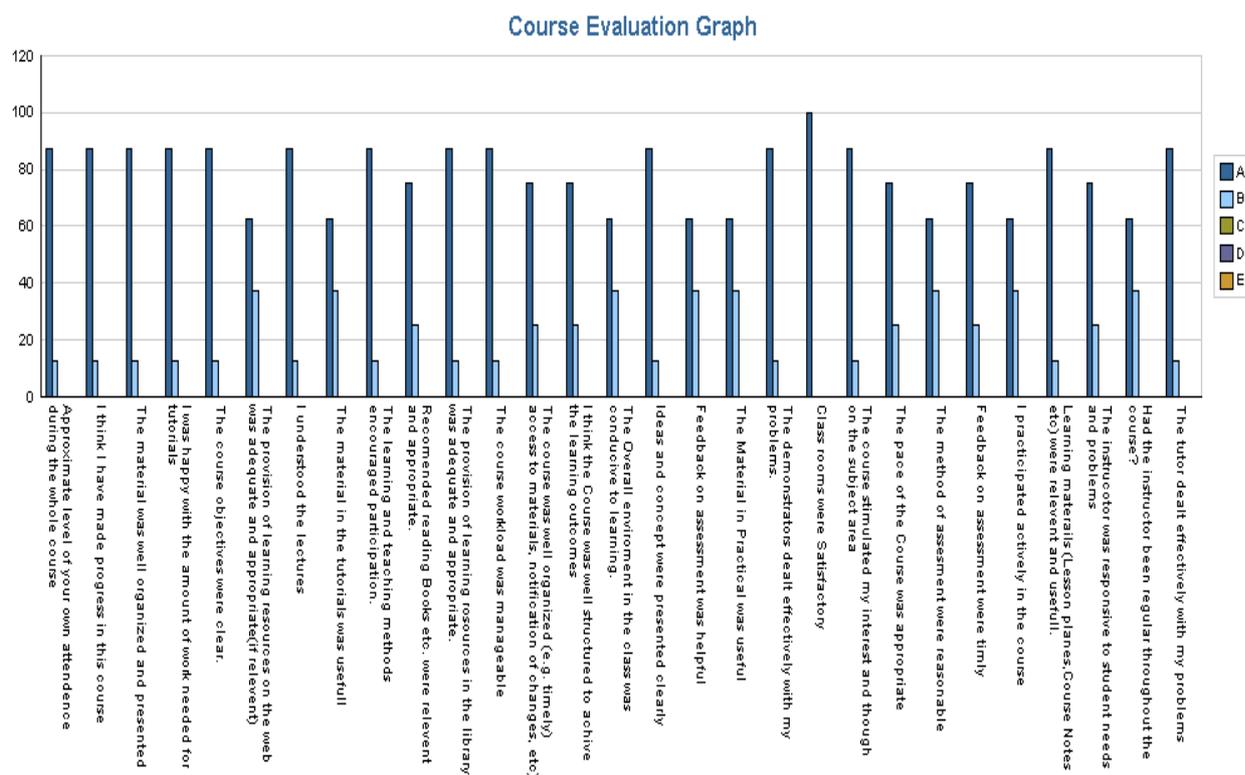


Figure 16. Course Evaluation of WL-706 during Fall-2013

Discussion:

The majority of the students were satisfied and termed the course interesting, well organized, with clear objectives. The students were satisfied with the pace of the course during the semester, provision of learning resources and feedback on assignment timely and helpful. The students thought that the instructor was punctual and was helpful in solving the problems.

WL-707

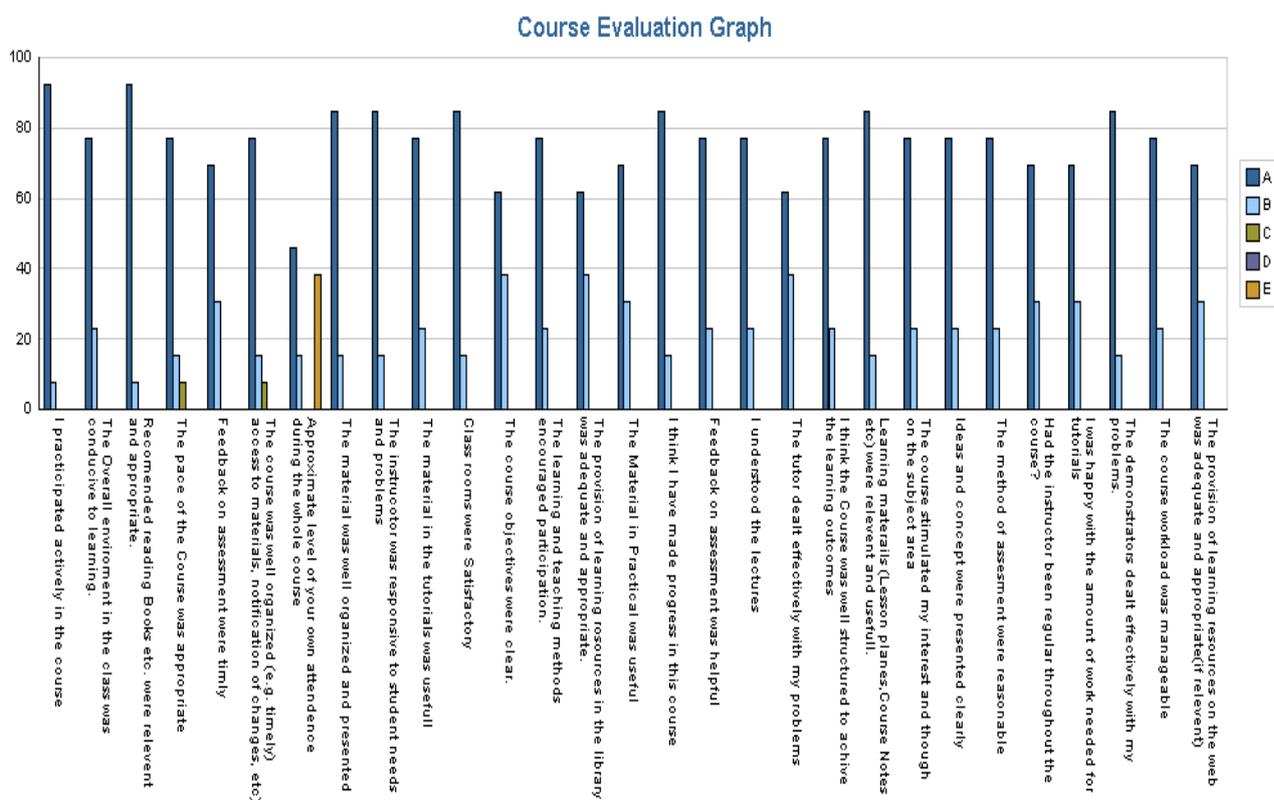


Figure 17. Course Evaluation of WL-707 during Spring 2014

Discussion:

The majority of the students were satisfied and termed the course interesting, well organized, with clear objectives. The students were satisfied with the pace of the course during the semester, provision of learning resources and feedback on assignment timely and helpful. The students thought that the instructor was punctual and was helpful in solving the problems. Few students were unsatisfied with their approximate level of attendance.

WL-708

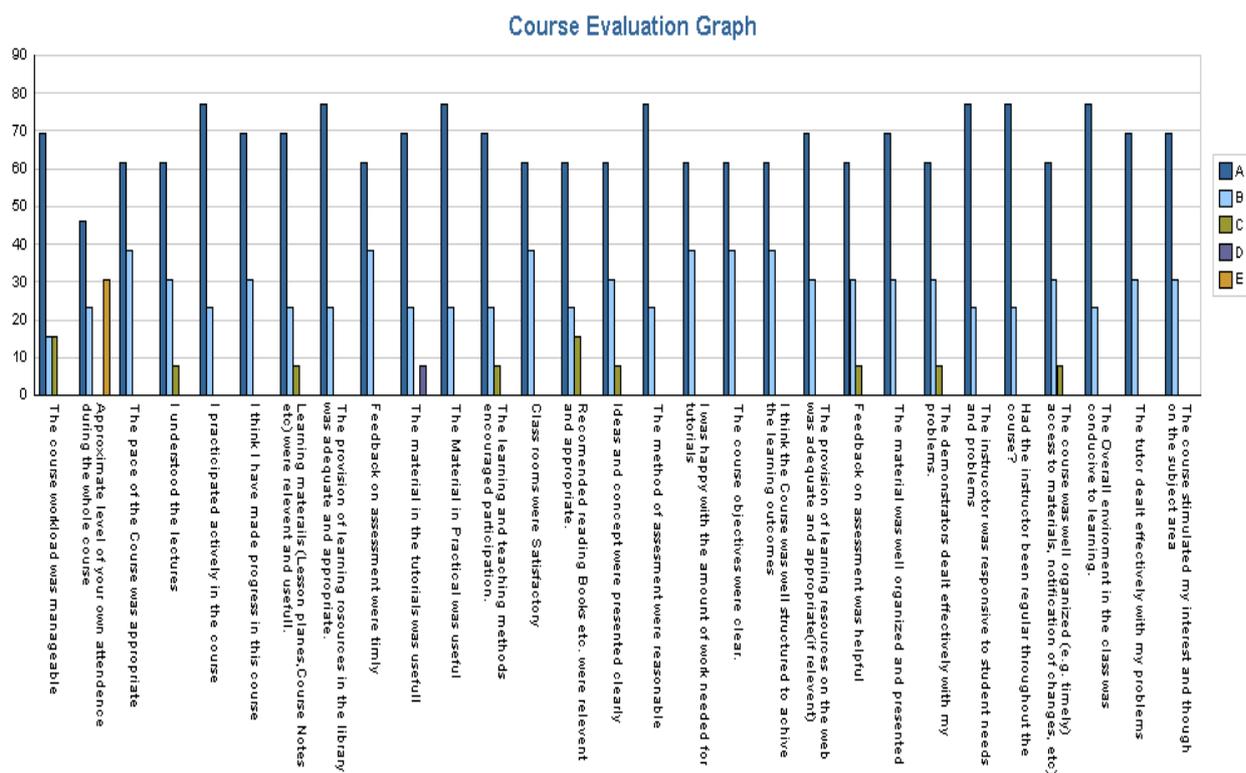


Figure 18. Course Evaluation of WL-708 during Spring-2014

Discussion:

The majority of the students were satisfied and termed the course interesting, well organized, with clear objectives. The students were satisfied with the pace of the course during the semester, provision of learning resources and feedback on assignment timely and helpful. The students thought that the instructor was punctual and was helpful in solving the problems. Few students were unsatisfied with their approximate level of attendance.

WL-709

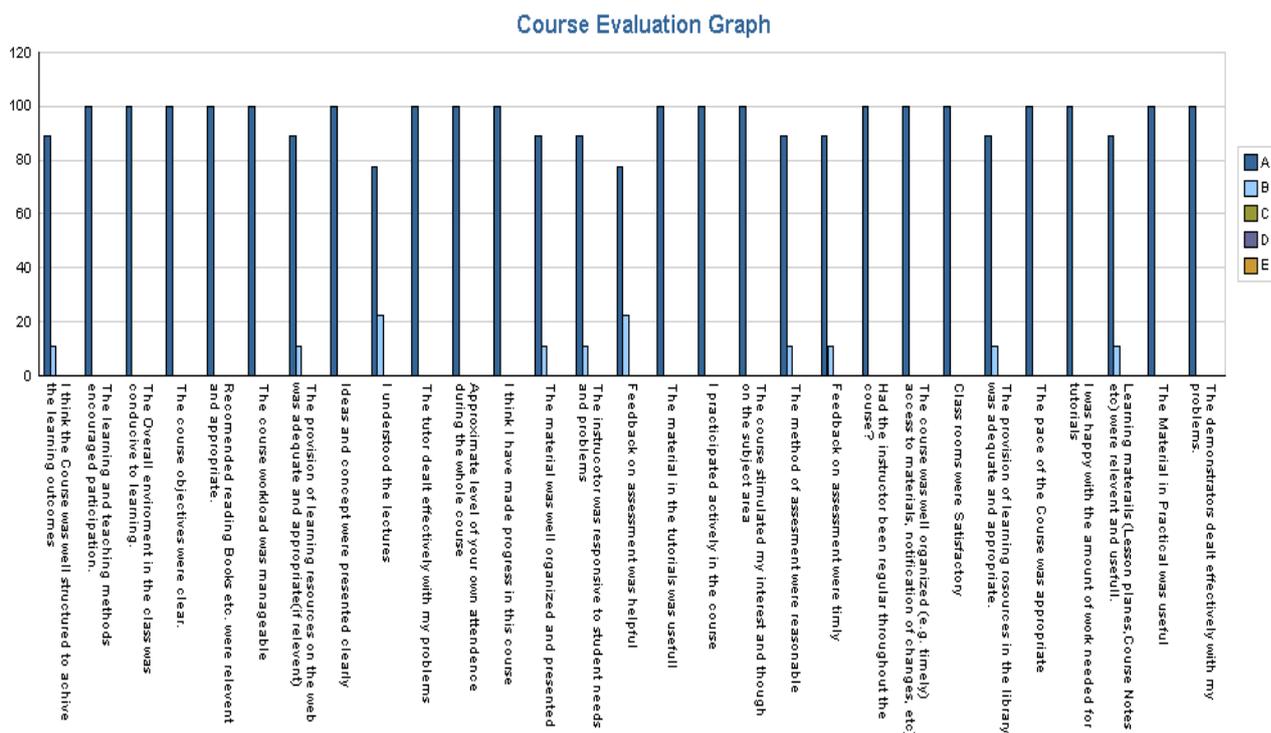


Figure 19. Course Evaluation of WL-709 during Spring-2013

Discussion:

The majority of the students were satisfied and termed the course interesting, well organized, with clear objectives. The students were satisfied with the pace of the course during the semester, provision of learning resources and feedback on assignment timely and helpful. The students thought that the instructor was punctual and was helpful in solving the problems.

WL-711

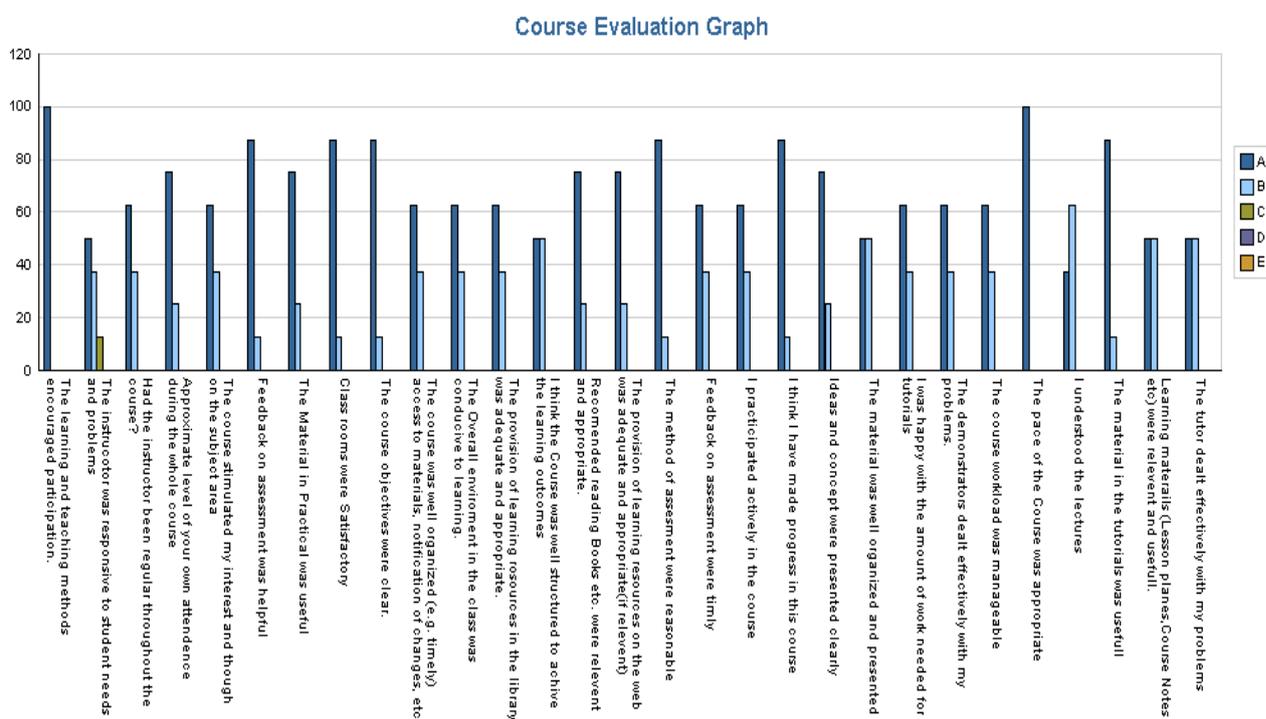


Figure 20. Course Evaluation of WL-711 during Fall-2013

Discussion:

The majority of the students were satisfied and termed the course interesting, well organized, with clear objectives. The students were satisfied with the pace of the course during the semester, provision of learning resources and feedback on assignment timely and helpful. The students thought that the instructor was punctual and was helpful in solving the problems. Few students were unsatisfied with instructors' response to student's problems and issues.

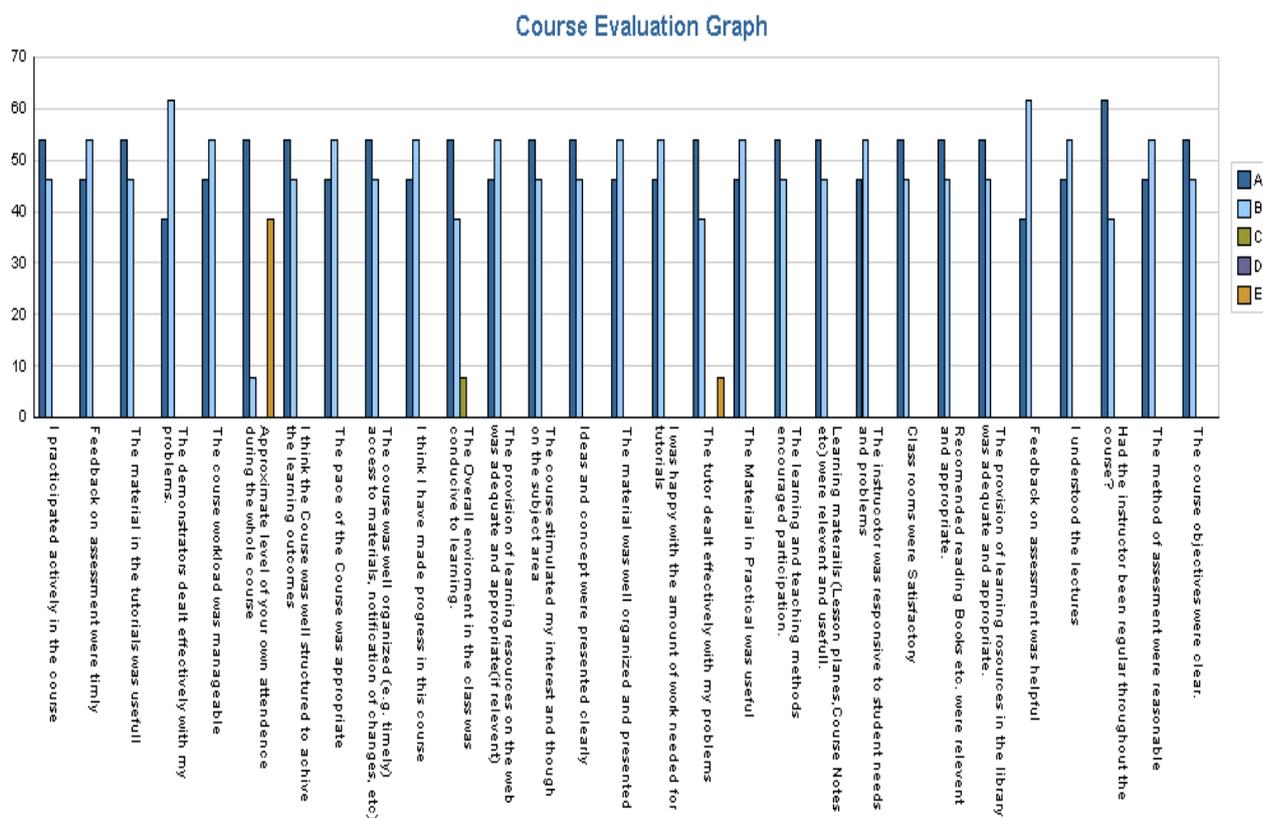


Figure 21. Course Evaluation of WL-712 during Fall-2013 Discussion:

The majority of the students were satisfied and termed the course interesting, well organized, with clear objectives. The students were satisfied with the pace of the course during the semester, provision of learning resources and feedback on assignment timely and helpful. The students thought that the instructor was punctual and was helpful in solving the problems. Few students were unsatisfied with their approximate level of attendance.

WL-714

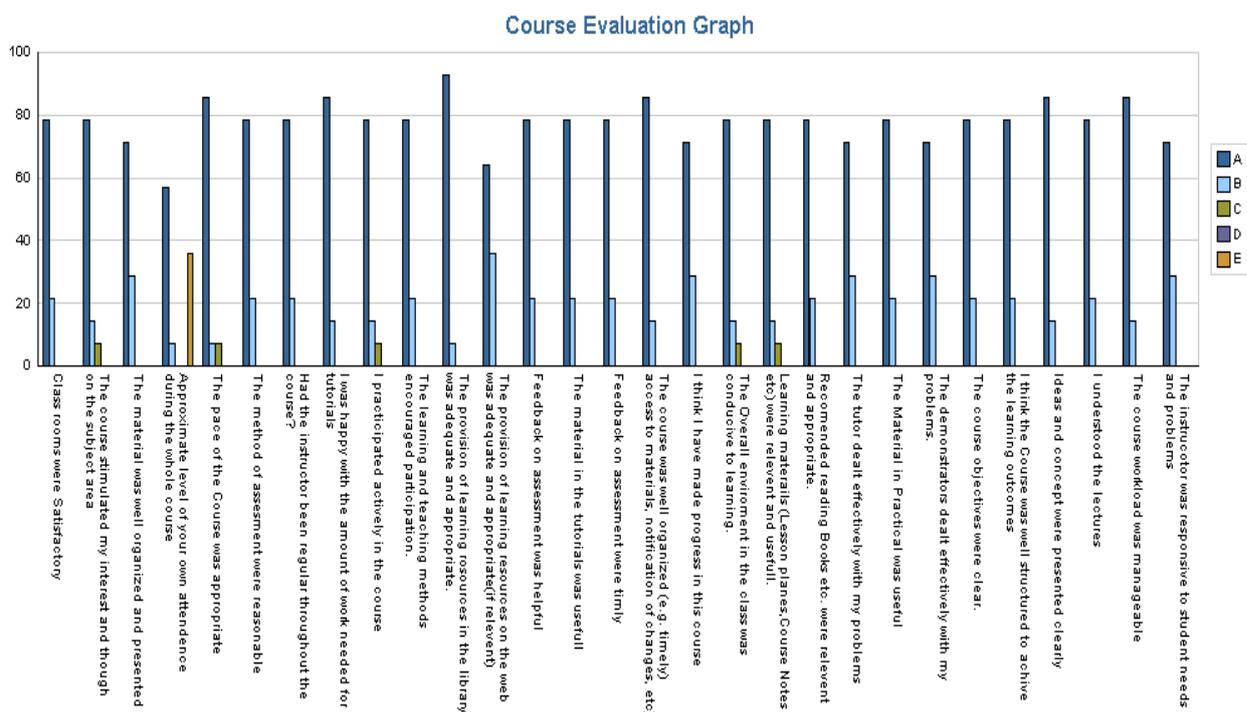


Figure 22. Course Evaluation of WL-714 during Spring 2014

Discussion:

The majority of the students were satisfied and termed the course interesting, well organized, with clear objectives. The students were satisfied with the pace of the course during the semester, provision of learning resources and feedback on assignment timely and helpful. The students thought that the instructor was punctual and was helpful in solving the problems. Few students were unsatisfied with their approximate level of attendance.

WL-716

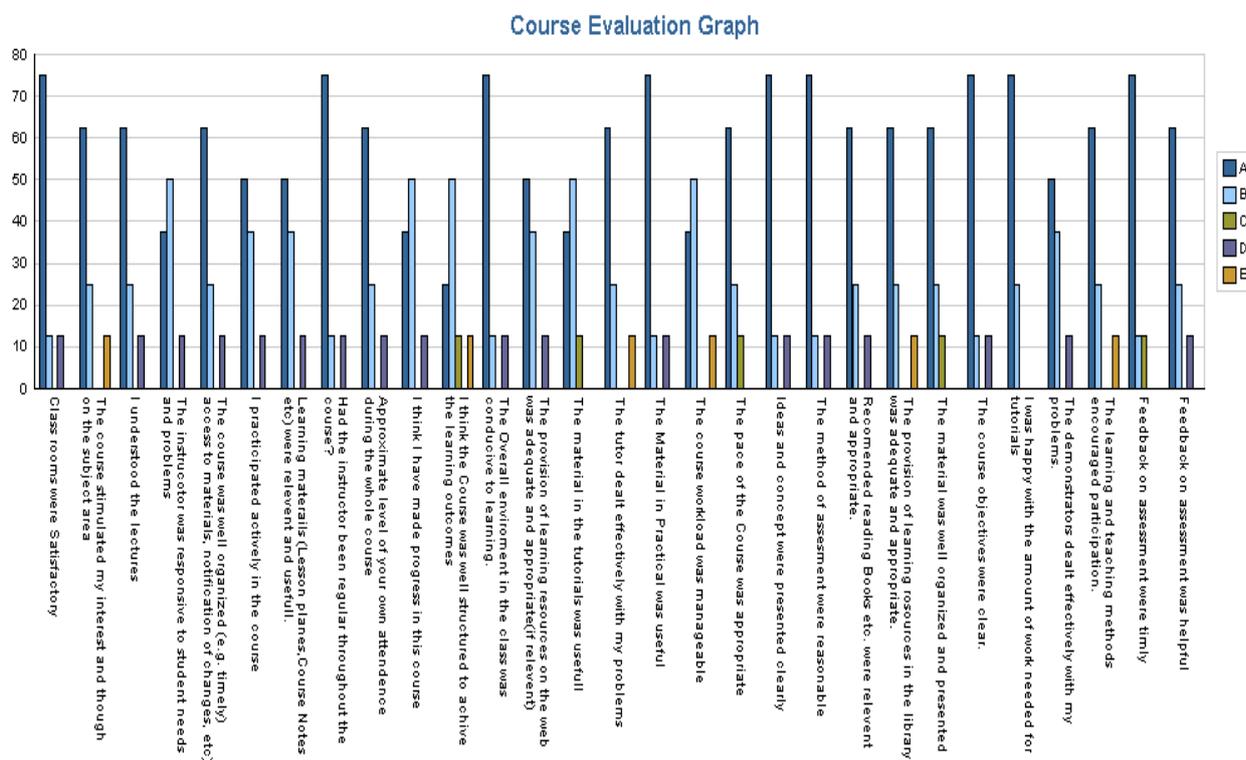


Figure 23. Course Evaluation of WL-716 during Fall-2013

Discussion:

The majority of the students gave mixed responses about the course interesting, well organized, with clear objectives. The students were satisfied with the pace of the course during the semester, provision of learning resources and feedback on assignment timely and helpful. The students thought that the instructor was punctual and was helpful in solving the problems.

WL-718

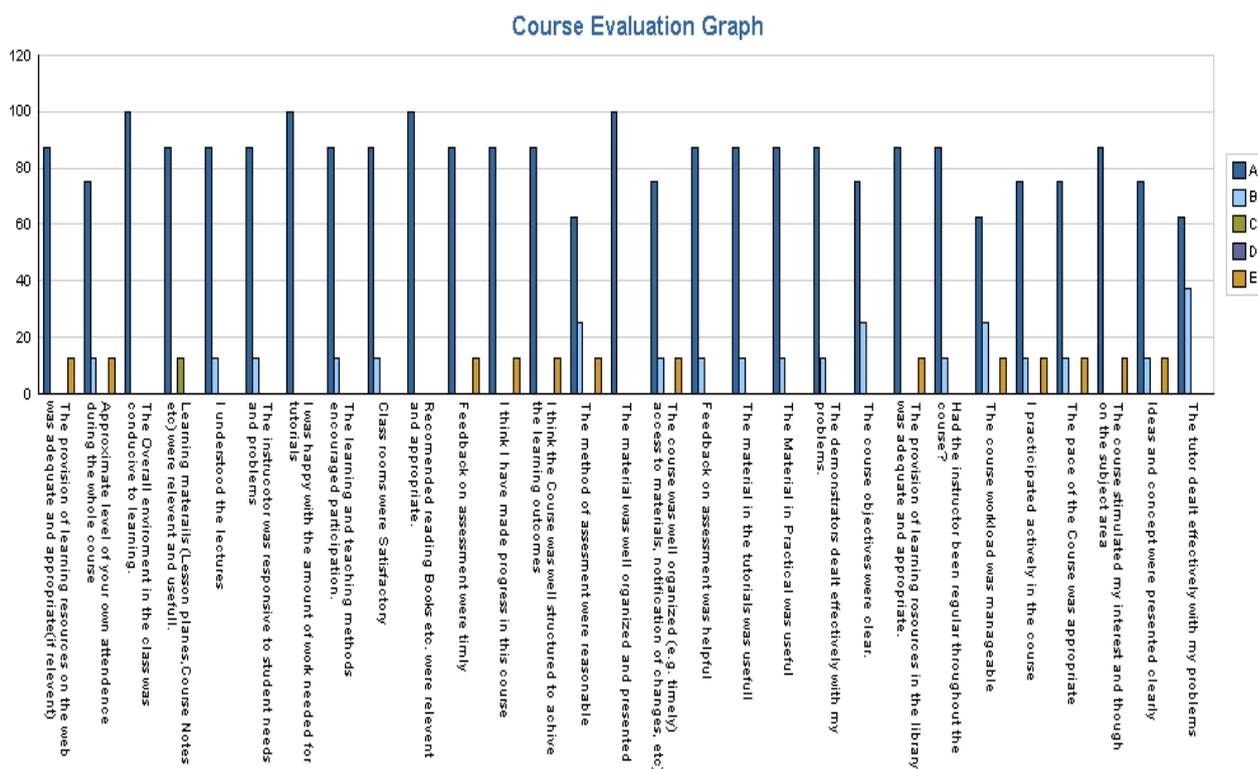


Figure 24. Course Evaluation of WL-718 during Spring-2014

Discussion:

The majority of the students were satisfied and termed the course interesting, well organized, with clear objectives. The students were satisfied with the pace of the course during the semester, provision of learning resources and feedback on assignment timely and helpful. The students thought that the instructor was punctual and was helpful in solving the problems.

WL-726

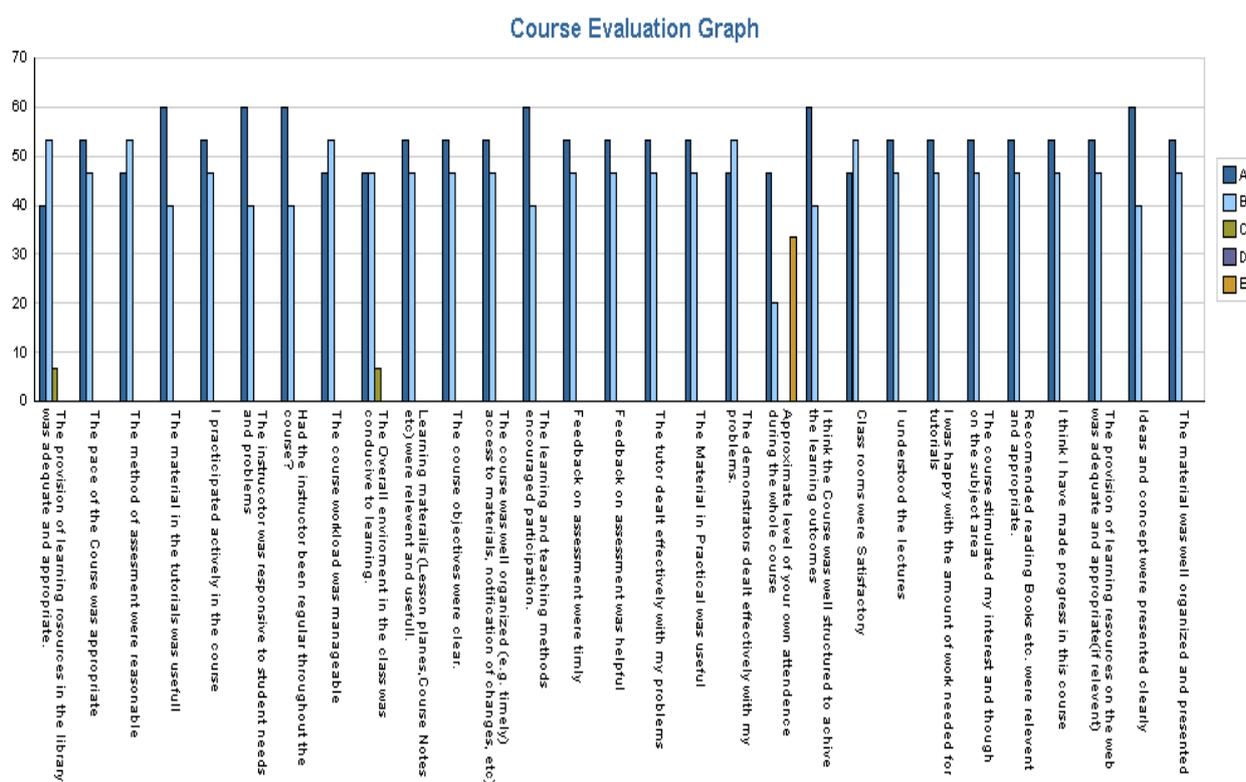


Figure 25. Course Evaluation of WL-726 during Fall-2013

Discussion:

The majority of the students were satisfied and termed the course interesting, well organized, with clear objectives. The students were satisfied with the pace of the course during the semester, provision of learning resources and feedback on assignment timely and helpful. The students thought that the instructor was punctual and was helpful in solving the problems. Few students were unsatisfied with their approximate level of attendance.

WL-729

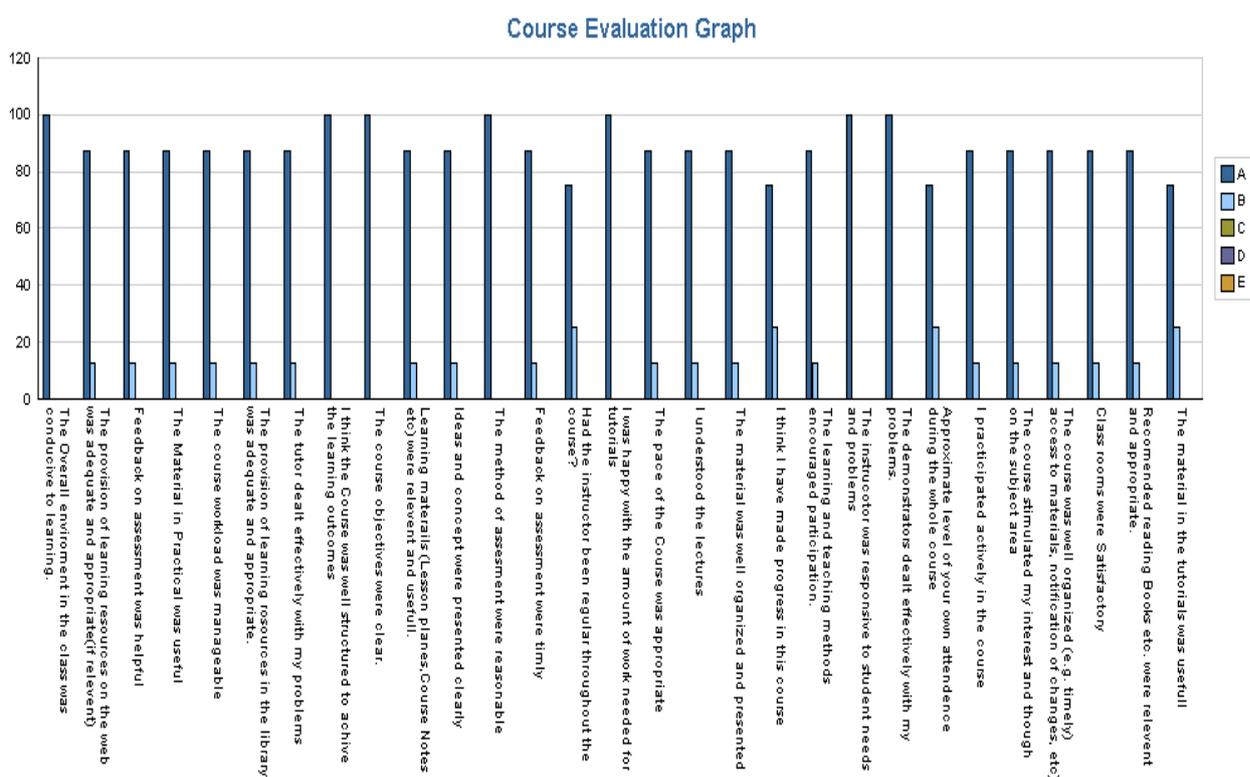


Figure 26. Course Evaluation of WL-729 during Spring-2014

Discussion:

The majority of the students were satisfied and termed the course interesting, well organized, with clear objectives. The students were satisfied with the pace of the course during the semester, provision of learning resources and feedback on assignment timely and helpful. The students thought that the instructor was punctual and was helpful in solving the problems.

FACULTY COURSE REVIEW REPORT

At the time of completion of each semester, each faculty member for each course offered during the semester filled and completed **performa 2** (online on CMS) to compile the Faculty Course Review report. The results and details of the said review report are shown below as Tables 4 to 15.

PMAS-Arid Ariculture University Rawalpindi
Faculty Course Review Report

Department: Department of Wildlife Management
 Course Code: WL-701 Title: Introduction to Wildlife of Pakistan
 Session: 2013 Semester: 60
 Credit Value: 3(2-2) Lectures: 60
 No. of Students: 13 Seminars: 0
 Contact Hours:
 Assessment Methos: Mid-Term Exam=12 Assignment=04 Final Exam=24 Practical=20

Distribution of Grade/Marks and other Outcomes

Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	0	0	0	0	0	0	0	0	0	0
Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	13	8	5	0	0	0	0	0	0	0

Overview/Evaluation (Course Co-coordinator Comments)

Table 4. Faculty Course Review Report of the course WL-701 for fall 2013

PMAS-Arid Ariculture University Rawalpindi
Faculty Course Review Report

Department: Department of Wildlife Management
 Course Code: WL-701 Title: Introduction to Wildlife of Pakistan
 Session: 2013 Semester: 60
 Credit Value: 3(2-2) Lectures: 60
 No. of Students: 13 Seminars: 0
 Contact Hours:
 Assessment Methos: Mid-Term Exam=12 Assignment=04 Final Exam=24 Practical=20

Distribution of Grade/Marks and other Outcomes

Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	0	0	0	0	0	0	0	0	0	0
Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	13	8	5	0	0	0	0	0	0	0

Overview/Evaluation (Course Co-coordinator Comments)

Table 5. Faculty Course Review Report of the course WL-702 for fall 2013

PMAS-Arid Ariculture University Rawalpindi
Faculty Course Review Report

Department: Department of Wildlife Management
 Course Code: WL-706 Title: Wildlife Management at Wetlands
 Session: 2013 Semester: 62
 Credit Value: 3 (2-2) Lectures: 62
 No. of Students: 8 Seminars: 0
 Contact Hours:
 Assessment Methos: Mid term:12; Assignment:04; Final:24; Practical:20

Distribution of Grade/Marks and other Outcomes

Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	0	0	0	0	0	0	0	0	0	0
Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	8	0	2	5	1	0	0	0	0	0

Overview/Evaluation (Course Co-coordinator Comments)

Table 6. Faculty Course Review Report of the course WL-706 for Fall 2013.

PMAS-Arid Ariculture University Rawalpindi
Faculty Course Review Report

Department: Department of Wildlife Management
 Course Code: WL-707 Title: Terrestrial Wildlife Management
 Session: 2014 Semester: 48
 Credit Value: 3(3-0) Lectures: 48
 No. of Students: 8 Seminars: 0
 Contact Hours:
 Assessment Methos: Mid term:18; Assignment:06; Final:36

Distribution of Grade/Marks and other Outcomes

Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	0	0	0	0	0	0	0	0	0	0
Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	13	9	4	0	0	0	0	0	0	0

Overview/Evaluation (Course Co-coordinator Comments)

Table 7. Faculty Course Review Report of the course WL-707 for Spring 2014.

PMAS-Arid Ariculture University Rawalpindi
Faculty Course Review Report

Department: Department of Wildlife Management
 Course Code: WL-708 Title: Wildlife Damage Management
 Session: Spring2013 Semester: 32
 Credit Value: 3(2-2) Lectures: 32
 No. of Students: 9 Seminars: 0
 Contact Hours: 64
 Assessment Methos: Exams Weight-age (Mid, Assignment, Final): a)Theory: 66.67% Mid-Term: 30% Assignments: 10% (Presentations) Final-Term: 60% b)Practical (Final-Term): 33.33%

Distribution of Grade/Marks and other Outcomes

Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	0	0	0	0	0	0	0	0	0	0
Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	9	0	67	33	0	0	0	0	0	9

Overview/Evaluation (Course Co-coordinator Comments)

Table 8. Faculty Course Review Report of the course WL-708 for Spring 2013.

PMAS-Arid Ariculture University Rawalpindi
Faculty Course Review Report

Department: Department of Wildlife Management
 Course Code: WL-709 Title: Society, Values and Economics of Wildlife
 Session: 2014 Semester: 43
 Credit Value: 3(3-0) Lectures: 43
 No. of Students: 12 Seminars: 0
 Contact Hours: 43
 Assessment Methos: Mid term Exam=18 marks Assignments=06 marka Final Exam=36 marks

Distribution of Grade/Marks and other Outcomes

Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	0	0	0	0	0	0	0	0	0	0
Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	12	25	50	25	0	0	0	0	0	0

Overview/Evaluation (Course Co-coordinator Comments)

Table 9. Faculty Course Review Report of the course WL-709 for spring 2014

PMAS-Arid Agriculture University Rawalpindi
Faculty Course Review Report

Department: Department of Wildlife Management
 Course Code: WL-712 Title: Conservation biology of wildlife
 Session: 2013 Semester:
 Credit Value: 3(3-0) Lectures 50
 No. of Students: 13 Seminars: 0
 Contact Hours:
 Assessment Methods: Mid term:18; Assignment:06; Final:36

Distribution of Grade/Marks and other Outcomes

Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	0	0	0	0	0	0	0	0	0	0
Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	13	0	9	4	0	0	0	0	0	0

Overview/Evaluation (Course Co-coordinator Comments)

Table 10. Faculty Course Review Report of the course WL-712 for fall 2013.

PMAS-Arid Agriculture University Rawalpindi
Faculty Course Review Report

Department: Department of Wildlife Management
 Course Code: WL-714 Title: Reproductive Biology and Breeding
 Session: 2014 Semester:
 Credit Value: 3(2-2) Lectures 60
 No. of Students: 14 Seminars: 14
 Contact Hours: 60
 Assessment Methods: Mid-term exam=12 Assignment=04 Final term=24 Practical=20

Distribution of Grade/Marks and other Outcomes

Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	0	0	0	0	0	0	0	0	0	0
Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	14	8	5	1	0	0	0	0	0	0

Overview/Evaluation (Course Co-coordinator Comments)

Table 11. Faculty Course Review Report of the course WL-714 for Spring 2014.

PMAS-Arid Ariculture University Rawalpindi
Faculty Course Review Report

Department: Department of Wildlife Management
 Course Code: WL-716 Title: Wild Fish Fauna of Pakistan
 Session: 2013 Semester: Lectures 48
 Credit Value: 3(3-0) Seminars: 0
 No. of Students: 8
 Contact Hours: 48
 Assessment Methos: Mid-term exam=18 Assignment=06 Final exam=36

Distribution of Grade/Marks and other Outcomes

Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	0	0	0	0	0	0	0	0	0	0
Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	8	3	5	0	0	0	0	0	0	0

Overview/Evaluation (Course Co-coordinator Comments)

Table 12. Faculty Course Review Report of the course WL-716 for fall 2013

PMAS-Arid Ariculture University Rawalpindi
Faculty Course Review Report

Department: Department of Wildlife Management
 Course Code: WL-718 Title: Captive wildlife management
 Session: 2014 Semester: Lectures 48
 Credit Value: 3(3-0) Seminars: 0
 No. of Students: 8
 Contact Hours: 48
 Assessment Methos: Mid-term exam=18 Assignment=06 Final term=36

Distribution of Grade/Marks and other Outcomes

Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	0	0	0	0	0	0	0	0	0	0
Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	8	6	2	0	0	0	0	0	0	0

Overview/Evaluation (Course Co-coordinator Comments)

Table 13. Faculty Course Review Report of the course WL-718 for Spring 2014

PMAS-Arid Ariculture University Rawalpindi
Faculty Course Review Report

Department: Department of Wildlife Management
 Course Code: WL-726 Title: Essentials of Wildlife Conservation
 Session: 2013 Semester: Lectures 48
 Credit Value: 3(3-0)0 Seminars: 0
 No. of Students: 0
 Contact Hours:
 Assessment Methods: Mid=18; Final=36; Assignment=6

Distribution of Grade/Marks and other Outcomes

Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	0	0	0	0	0	0	0	0	0	0
Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	16	3	11	1	0	0	1	0	0	0

Overview/Evaluation (Course Co-coordinator Comments)

Table 14. Faculty Course Review Report of the course WL-726 for fall 2013

PMAS-Arid Ariculture University Rawalpindi
Faculty Course Review Report

Department: Department of Wildlife Management
 Course Code: WL-729 Title: Biology and Conservation of Amphibians and Reptiles
 Session: 2014 Semester: Lectures 62
 Credit Value: 3(2-2) Seminars: 0
 No. of Students: 13
 Contact Hours:
 Assessment Methods: Mid term:12; Assignment:04; Final:24; Practical:20

Distribution of Grade/Marks and other Outcomes

Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	0	0	0	0	0	0	0	0	0	0
Undergraduate	Originally Registered	% Grade A	% Grade B	% Grade C	% Grade D	% Grade E	% Grade F	No Grade	Withdrawal	Total
No. of Students	8	3	5	0	0	0	0	0	0	13

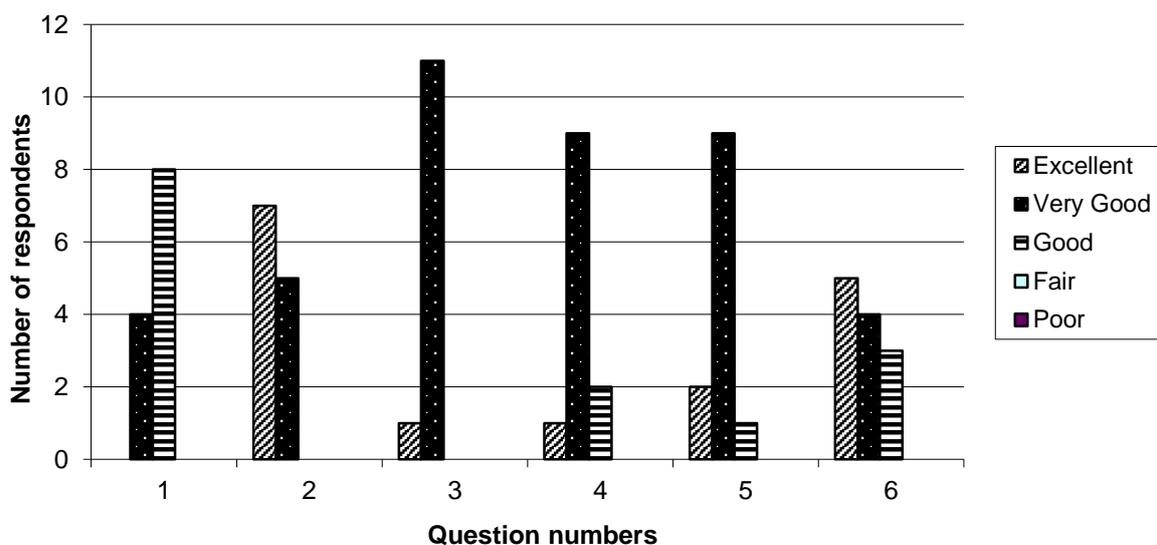
Overview/Evaluation (Course Co-coordinator Comments)

Table 15. Faculty Course Review Report of the course WL-729 for spring 2014

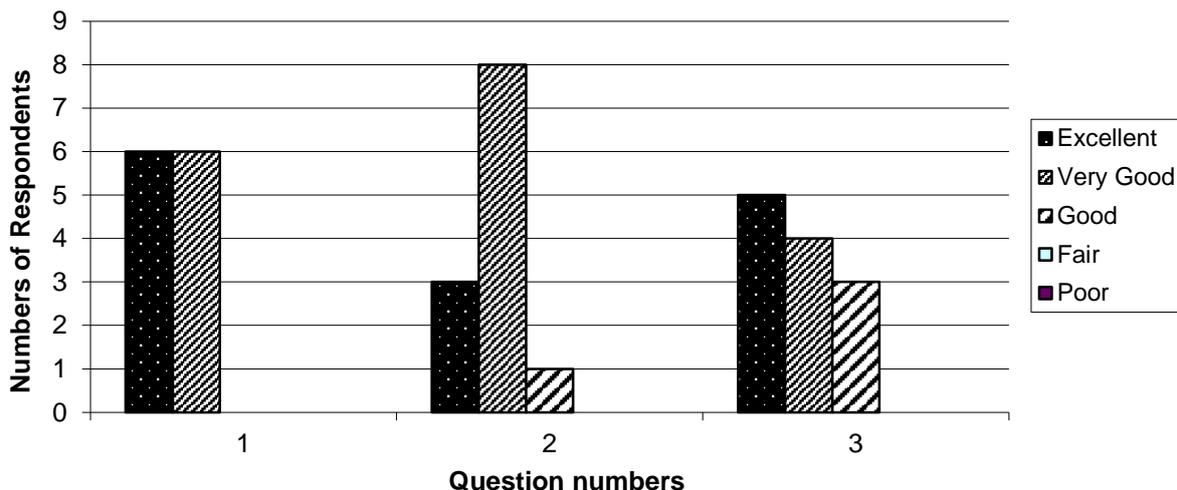
ALUMNI SURVEY RESULTS

Feedback of students graduated during 2012 and 2013 was acquired through **Proforma-7**. Majority of the Alumni have rated the knowledge imparted by the department and communication skills as very good. Interpersonal skills and management/leadership skills have also been given good. Results of the survey are presented in Fig. 27(I-V).

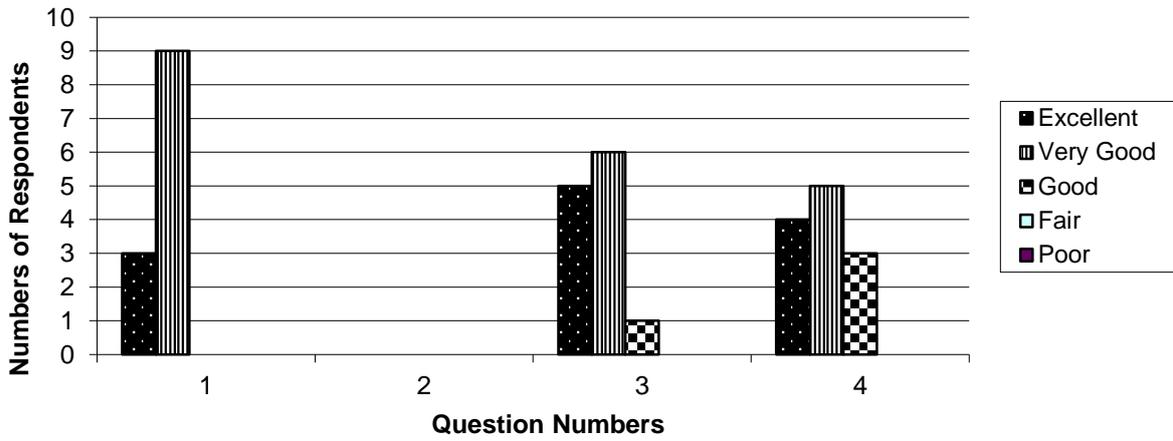
Alumni Survey-I- Knowledge



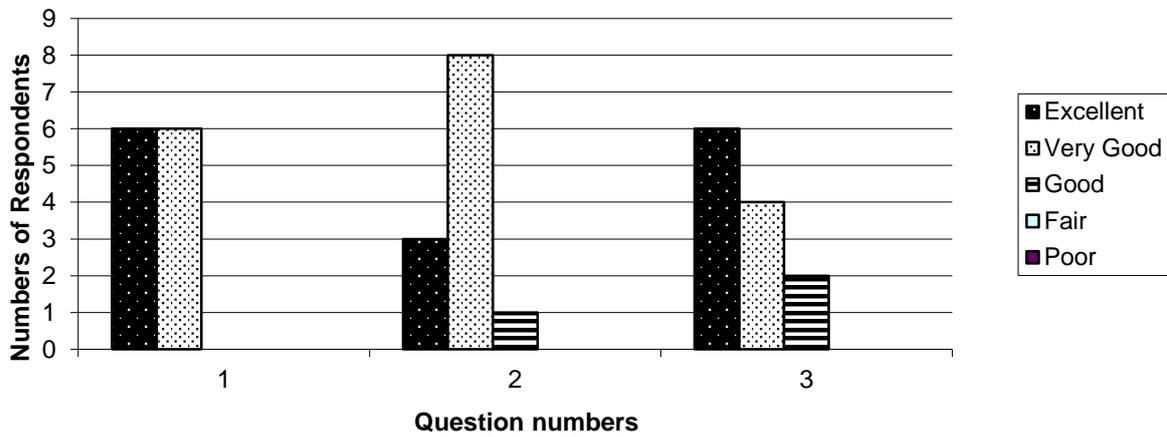
Alumni Survey-II-Communication skills



Alumni Survey-III- Interpersonal Skills



Alumni Survey-IV- Management Skills



Alumni Survey-V-Department Status

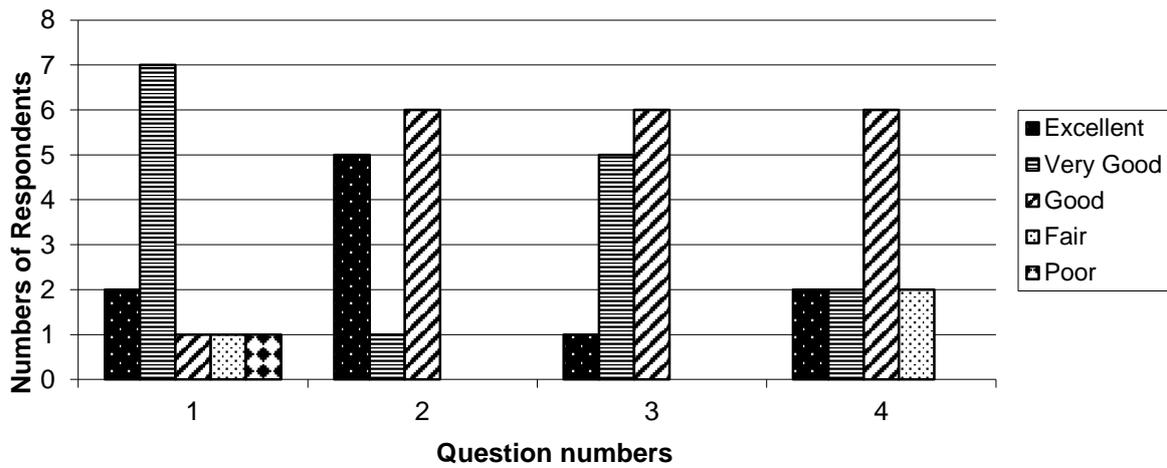


Figure 27(I-V). Alumni Survey Results.

SURVEY OF GRADUATING STUDENTS

Survey of graduating students was conducted through **Performa 3**. On the average 40% students showed their high satisfaction regarding all the parameters asked. With respect to enhancing team work skills and written communication skills, 100% students were highly satisfied. The results of the survey are given below in Fig. 28.

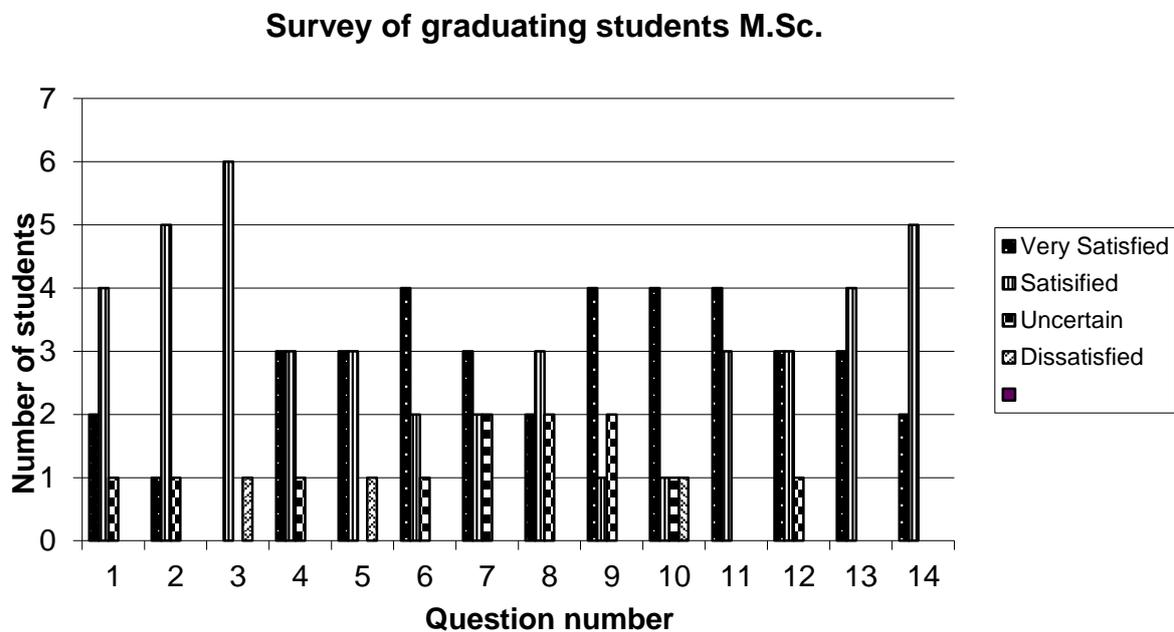


Figure 28. Survey results for Graduating students (M.Sc.)

❖ Employer Survey

As there was no graduating student working in the departments by the end of spring semester 2014, the employer survey under **Performa 8** was not conducted.

Standard 1-3. The results of program’s assessment and the extent to which they are used to improve the program must be documented

Regular assessment process will be continued and results will be incorporated accordingly. Following are the strengths and weaknesses of program identified.

Strengths of the Program

1. The department is having qualified teachers with full acquaintance of their respective subjects, knowledge of research and management techniques for study of wildlife.
2. There is one professor, one associate professor in the department both are foreign qualified, one assistant professor who got Ph.D. degree from Quid-i-Azam University, Islamabad, one lecturer with Ph.D. in Zoology (with specialization in wildlife) from Karachi University and one lecturer has completed her M.Phil. (Wildlife Management) from PMAS-AAU Rawalpindi. Three faculty members are HEC approved supervisors who can supervise Ph.D. students.

3. All faculty members are involved in research directly or indirectly as supervisor and committee member of the post-graduate students.
4. Two faculty members (one assistant professor and one lecturer) have got six months training in wildlife from foreign universities (USA and Malaysia).
5. All faculty members have got research projects funded from various funding sources.
6. Two laboratories have been established with basic necessary equipment in addition to having equipments to carry out field studies on wildlife species.
7. The department has got a development project funded by HEC under which necessary field and laboratory equipment and class room aids have been purchased to strengthen academic and research activities of the department.
8. Department has signed MoUs with five public and private sector organizations to facilitate its research projects and students' theses research.

Weaknesses of the Program

1. There is scarcity of space as there is only one class room due to which difficulty is faced in adjusting simultaneous classes.
2. Two faculty members are housed in cabins within the laboratories due to which working and sitting place (for Ph.D. students) has become insufficient. The laboratories are also filled with equipments purchased under the HEC project. Therefore, at least two faculty office rooms, one store room and one laboratory are needed to meet the needs.
3. Wildlife is an applied, field-based subject which needs extensive touring for imparting firsthand knowledge to the students and therefore, there is need of having a suitable field vehicle.
4. Coordination with federal and provincial wildlife departments and other organizations is currently under development which needs to be further facilitated/ enhanced for field tours and research studies.

Standard 1-4. The department must assess its overall performance periodically using quantifiable measures.

The evaluation process indicated high efficiency of system and satisfactory impact of outcomes (Table 4).

Table 4. Performance measures for research activities

Faculty	Publications in Journals	Research & Development Projects
Dr. Iftikhar Hussain	13	0
Dr. Maqsood Anwar	13	1
Dr. Tariq Mahmood	14	1
Mr. Muhammad Rais	9	3
Ms. Bushra Allah Rakha	18	2

Future Plans

The Department of Wildlife Management has planned a number of research studies in future addressing the issues of wildlife conservation and protected areas management including wetlands and collecting data on biology/ecology of wildlife species particularly the threatened species. Some of the studies/activities include:

1. Population density/size, habitat utilization/preference, breeding habits/biology of wildlife species, especially rare and threatened species
2. Food habits, diet composition and food preference of wildlife species, particularly focusing on ungulates, carnivore and threatened bird species.
3. Distribution range/pattern of wildlife species especially focusing on Pothwar area.
4. Baseline data on protected areas including wildlife diversity, threatened or rare species studies, social issues and major threats to the PAs.
5. Baseline data on wetlands including both resident and migratory waterfowl and threats to the ecosystem.
6. Wildlife damage assessment / management particularly of rodent pests, porcupine and wild boar.
7. To impart quality education in wildlife management/conservation through study tours, audio visual aids along with provision of latest literature, journals, books and internet.
8. To impart training to employees of wildlife/forest departments, other relevant organizations and NGOs in wildlife research and management.
9. To develop strong collaboration and linkages with wildlife related government departments and NGOs for wildlife conservation and research.
10. To equip the department with the advanced equipments both for laboratories and field surveys/studies of wildlife species.
11. To enhance knowledge and skills of faculty members about latest advancements in wildlife/biodiversity research and conservation through exchange programs, short trainings and collaborative research projects within and outside Pakistan.

Faculty satisfaction regarding the administrative services

- The department maintains a ratio of 4:1 for the academic (including technical) and administrative/support (non-technical) staff which fulfils the standard set by HEC
- Administrative meetings (departmental, university, academic council, and syndicate) are attended as and when required.
- Office matters/files are disposed regularly and so far no complaint has been received from higher administrative authorities.
- Proper records/file of each employee and students are maintained.

Quantitative assessment of the department for the last two years is given in the Table 5.

Table 5. Quantitative assessment of the department (Fall 2012 to Spring 2014)

Sr. #	Particular	No.	Remarks
1	M. Sc. degree awarded	14	
2	M. Phil. degree awarded	19	
3	Ph.D. degree awarded	Nil	
4	Post-Doc fellowship	Nil	-
5	Students: Faculty ratio		Fulfils HEC criteria
6	Technical: Non-technical ratio		Fulfils HEC criteria

EMPLOYER SURVEY

As there was no graduating student working in the departments by the end of spring semester 2010, the employer survey under **Performa 8** was not conducted.

CRITERION2: CURRICULUM DESIGN AND ORGANIZATION

A. Intent

All courses for M.Sc. were initially developed by faculty members and finalized after sharing with relevant government departments, NGOs, universities and individual experts. During the course of time, a few courses have been revised and some new courses added based on the need felt by the department. Curriculum and course contents are finally approved by the University Academic Council.

B. Definition of credit hour

One credit hour is one theory lecture or two hours laboratory practical per week. A credit hour carries 20 marks.

C. Degree plan - pre-requisites

B.Sc. with a minimum of 45% marks or its equivalent from a recognized institution in related subjects Biological sciences with Zoology as one of the major subject/Forestry & Range Management or an equivalent qualification in relevant discipline from a HEC recognized institution.

The selection criterion for each course is as follows;

- The course is relevant to the degree program
- It meets the national and international requirements for the degree
- Adequate facilities are available in the department to offer the courses
- The course contents meet the program objectives as highlighted and provided by the Higher Education Commission of Pakistan.

Each course in the program is to be completed for credits specifying the following:

- Course title (WL)
- Course objectives and outcome (Given in course breakdown into lectures separately)
- Catalogue description (yes)
- Text book and reference (Given in course contents)
- Syllabus breakdown in lectures (yes supplied to QEC separately)
- **Computer usage:** Internet facility is used by faculty members to update their knowledge regarding each course, research studies and recent references. Students also use this facility to solve their problems, assignments and presentations.
- **Laboratory facilities** are provided to the students for their practical exercise, given in the curricula. Post-graduate students also use laboratories for their theses research where equipment, material and chemicals are provided.

D. Degree requirements

The duration of M.Sc. degree shall not be less than four semesters for whole time students and not less than six semesters for part time/partial residents and not more than six and eight semesters, respectively. Each student has to complete a minimum of 60 credits for the award of degree. Student may opt for thesis carrying 10 credits (not counted towards calculation of CGPA). List of major courses for M.Sc. is given in Table 6.

Table 6. Course Requirements for M.Sc. in Wildlife Management

S. No.	Course No	Course Title	Credit Hours
1	WL-701	An Introduction to Wildlife of Pakistan	3 (2-2)
2	WL-702	Wildlife Population Ecology	3 (3-0)
3	WL-706	Wildlife Management at Wetlands	3 (3-0)
4	WL-707	Terrestrial Wildlife Management	3 (3-0)
5	WL-708	Wildlife Damage Management	3 (2-2)
6	WL-709	Society, Values & Economics of Wildlife	3 (3-0)
7	WL-711	Research Planning and Report Writing	3 (1-4)
8	WL-712	Conservation Biology of Wildlife	3 (3-0)
9	WL-714	Reproductive Biology and Breeding	3 (2-2)
10	WL-716	Wild Fish fauna of Pakistan	3 (3-0)
11	WL-718	Captive Wildlife Management	3 (3-0)
12	WL-719	Special Problem	1 (1-0)
13	WL-720	Seminar	1 (1-0)
14	WL-726	Essentials of Wildlife Conservation- National Perspectives	3 (3-0)
15	WL-729	Biology and Conservation of Amphibians and Reptiles	3 (2-2)

Standard 2.1. The curriculum must be consistent and support the program's documented objectives.

The curriculum of Department is consistent with the program objectives (Table 7).

Table 7. Courses with relation to their outcomes

Course	Objectives		
	HRD	Priority of Research	Integrated approaches
Wildlife management/ conservation	+++	++	+ +++
Wildlife study/ management techniques	+++	+++	++++
Wildlife ecology	++	+++	+++
Wildlife biology	++	++	++
In-situ conservation	++	++	++
Ex-situ conservation	+	+	+
Policy/law/social issues	+	+	++

+ = Relevant, ++ = Relevant & satisfactory, +++ = Very relevant & satisfactory, ++++ = highly relevant & highly satisfactory

Assessment of the Department of Wildlife Management Curriculum

The assessment of curriculum given in Table 12 and the courses are cross tabulated according to the program outcomes.

1. The curriculum fits very well and satisfies the core requirements for the program, as specified by the respective accreditation body.

2. The curriculum satisfied the general arts and professional and other discipline required for the program according to demands and requirements set by the Higher Education Commission.

Standard 2.2. Theoretical background, problem analysis and solution design must be stressed within the program’s core material

Table 8. Courses representing theoretical background, problem analysis and solution design

Elements	Courses	Title of Courses
Theoretical Background	WL-701	An Introduction to Wildlife of Pakistan
	WL-702	Wildlife Population Ecology
	WL-709	Society, Values & Economics of Wildlife
	WL-714	Reproductive Biology and Breeding
	WL-716	Wild Fish fauna of Pakistan
Problem Analysis	WL-711	Research Planning and Report Writing
	WL-719	Special Problem
Solution Designs	WL-706	Wildlife Management at Wetlands
	WL-707	Terrestrial Wildlife Management
	WL-708	Wildlife Damage Management
	WL-712	Conservation Biology of Wildlife
	WL-718	Captive Wildlife Management
	WL-720	Seminar
	WL-726	Essentials of Wildlife Conservation-National Perspectives
	WL-729	Biology and Conservation of Amphibians and Reptiles

Standard 2-6. Information technology component of the curriculum must be integrated throughout the program

During curriculum development, all aspects of information technology were considered and after a critical analysis, relevant aspects were integrated into the program. Two courses of statistics (6 credit hours) based on computer practical were included in the curriculum to fulfill the requirements of the students.

Standard- 2.7.Oral and written communication skills of the student must be developed and applied in the program.

- Two seminars each of one credit hour are compulsory for post-graduate students.
- Special problem (one credit hour) is offered to the students which require writing a comprehensive report on a topic and presenting it in the class.

- A course of 3 credit hours entitled “Research planning and report writing” has been integrated in the curriculum for M.Sc. students.
- Assignments are given to all students in each course on specific titles relevant to the course which are presented orally and given as written assignments by the students which improve their oral and written communication skills.

CRITERION3. LABORATORIES AND COMPUTER FACILITIES

- Laboratory Title: Wildlife Management Laboratory -1
WildlifeManagement Laboratory-2
- Location and Area: Faculty of Forestry, Range Management and Wildlife, Ground and 1st Floor of Spur-D, Main Academic Block.
- Objectives: Laboratories are used by students and faculty for research studies including; autopsy of animals, micro-histological studies and food/diet composition analysis studies.

Research work for the graduate and post-graduate students

- Adequacy for instructions: Laboratories meet the requirements in terms of equipment, chemicals, furniture and general facilities, however, not spacious enough for demonstration and analysis studies.
- Major apparatus: Major equipments available in the Labs. include; microscopes, deep freezers, refrigerators, pH meters, electric balances, electric oven, slides, glass ware, centrifuge machine, spectrophotometer, tissue homogenizers, equipment for histological studies of animal tissues etc.
- Field Equipments: Binoculars, GPS, Cameras, Cages, live traps, spotting scopes, spring balances, camping gear, etc.
- Safety Regulations: Safety measures such as fire extinguishers, first aid kit are not available in the Labs. However, the University maintains a Medical Dispensary for minor incidents.

Standard 3.1. Laboratory manuals/documentation/instructions for experiments must be available and readily accessible to faculty and students.

Laboratory manuals of each subject are not available in the departmental library. However, books and manuals owned by individual faculty are used by the students. A number of books and manuals have been prepared in the department.

Standard 3.2. There must be adequate support personnel for instruction and maintenance of laboratory

Laboratories are maintained by two laboratory attendants and one laboratory assistant who assist the students in research studies, practical, cleaning and washing, etc. Students are instructed for Lab. work by respective faculty members.

Standard 3.3. The university computing infrastructure and facilities must be adequate to support program’s objectives

The University has limited computer facility for students. Computer facility is available at the department level to most of faculty members independently. However, it is not adequate to meet the objectives of the programme and needs improvement

CRITERION 4. STUDENT SUPPORT AND GUIDANCE

Directorate of Students Affairs of the University organizes support programs, cultural activities for students and guides them in case of any problem. The university staff provides information regarding admission, scholarships, career opportunities, etc. The university arranges orientation programme for new students and guided tours to various departments. However, currently Parent/Teacher association in the university does not exist.

Standard 4.1. Courses must be offered with sufficient frequency and number for students to complete the program in a timely manner.

- Courses are taught as per strategy and guidance provided by HEC.
- Subject courses are offered as per scheme of study of the department after approval of Academic Council of the university. Courses are offered by faculty trained in the relevant subject and as per their availability.
- Elective courses and minor courses are offered as per policy of HEC and University.

Standard 4.2. Courses in the major must be structured to ensure effective interaction between students, faculty and teaching assistants.

- Courses are structured and decided among the faculty members in the departmental board of study meeting.
- Courses to be offered are decided before the commencement of semester and the faculty members interact frequently among themselves and with students.
- Students are encouraged to ask question, give comments and take part in the discussions in the class.
- Emphasis is given on effective interaction between the students and between students and teachers.

Standard 4.3. Guidance on how to complete the program must be available to all students and access to qualified advising must be available to make course decisions and career choice.

- Students are informed about program requirements through office of chairperson of the department and through personal communication of teachers with them.
- The counseling of students is continuous process and students are free to contact relevant teachers whenever they face any professional problem.
- Students are also facilitated for interaction with faculties/scientists in other universities and research organizations whenever they need and there is open option for the students to get membership of professional societies.

CRITERION 5. PROCESS CONTROL

Standard 5.1. The process by which students are admitted to the program must be based on quantities criteria and clearly documented. This process must be periodically evaluated to ensure that it is meeting its objectives.

- The process of admission is well established and followed as per rules and criterion set by University for post graduate students of M.Sc.
- Admission criteria for M. Sc. program: 16 years of education in relevant field/subjects.
- All these entries are based on the recommendations of admission committees.
- Admission criteria is revised if required before the announcement of admissions.

Standard 5.2. The process by which students are registered in the program and monitoring of students progress to ensure timely completion of the program must be documented. This process must be periodically evaluated to ensure that it is meeting its objectives.

- Registration of students is done once every year at the time of admission. When a student is admitted for each degree, he/she is evaluated through the result of each course for each semester. If the students fulfill the criteria of the University (a specific CGPA after each semester) they are promoted to the next semester.
- Students are evaluated through Mid, Final and Practical exams and through written assignments and oral presentations.
- In general, the students are registered on competition bases keeping in view the academic and research standards.

Standard 5.3. The process of recruiting and retaining highly qualified faculty members must be in place and clearly documented. Also processes and procedures for faculty evaluation, promotion must be consistent with institution mission statement. These processes must be periodically evaluated to ensure that it is meeting with its objectives.

- The University follows the recruitment policy and rules recommended by HEC.
- Posts are advertised in national newspapers and university website, and applicants are short-listed on the basis of experience, qualification, publications and other qualities / activities as fixed by the University
- The candidates are interviewed by the University Selection Board and principal and alternate candidates are selected.
- Selection of candidates is approved by the Syndicate for issuing orders to join within a specified period.
- Induction of new candidates depends upon the number of approved vacancies.
- Recently, Tenure Track System (TTS) has been introduced by the University which is a good incentive for retaining highly qualified faculty members.
- HEC also supports appointment of highly qualified members as foreign faculty professor, national professors and deposes them in various departments.

Standard 5.4. The process and procedures used to ensure that teaching and delivery of course material to the students emphasizes active learning and that course learning outcomes are met. The process must be periodically evaluated to ensure that it is meeting its objectives.

- Periodical update of curriculum is done depending upon the requirements, innovations and new knowledge generated.
- New courses are developed and included in the curriculum when need arises.

- Books on various aspects of wildlife are available in the department and in University library where documentation, photocopying and internet facilities are also available. .
- Students also take notes during the classes and photocopies of slides/transparencies are also provided in addition to printed material.
- All efforts are made to impart the course material and knowledge to meet the objectives of the curriculum.

Standard 5.5. The process that ensures that graduates have completed the requirements of the program must be based on standards, effective and clearly documented procedures. This process must be periodically evaluated to ensure that it is meeting its objectives.

In the examination system of the University, the following are clearly mentioned;

- The evaluation procedure consists of quizzes, mid and final examinations, practical, assignments, reports and oral presentations.
- The controller of examinations announces the dates of examinations. After each semester, the controller office notifies results of the exams.
- The minimum passing marks for each course is 40% for M.Sc.in theory and practical, separately.
- In theory, weight age of each component of examination is as under:

Mid Examination	30%
Assignments	10%
Final Examination	60%

- Grade points are as follows

Marks	Grade	Grade point	Remarks
80-100 %	A	4	Excellent
65-79 %	B	3	Good
50-64 %	C	2	Satisfactory
40-49 %	D	1	Pass
Below 40 %	F	0	Fail

- Gold medals are awarded to the students who secure highest cumulative marks in each department. Degrees are awarded to the students in the convocation which is held every year.

CRITERION6. FACULTY

Standard 6-1. There must be enough full time faculty who are committed to the program to provide adequate coverage of the program areas/courses with continuity and stability. The interests and qualifications of all faculty members must be sufficient to teach all courses, plan, modify and update courses and curricula. All faculty members must have a level of competence that would normally be obtained through graduate work in the discipline. The majority of the faculty must hold a Ph.D. in the discipline.

Currently, there are five full time faculty members out of which four are Ph.D. and one M.Phil. in wildlife management. The fields of specialization of faculty members include;

wildlife management/conservation, wildlife study/management techniques, wildlife ecology, wildlife biology, in-situ conservation, ex-situ conservation and policy/law/social issues (Table 9).

Table 9. Faculty distribution by program area in wildlife management

S. No.	Area of specialization	Relevant Courses	Number of faculty members	Number of faculty with Ph.D. degree
1	Wildlife management/ conservation	7	4	4
2	Wildlife study/management techniques	4	4	4
3	Wildlife ecology	3	5	3
4	Wildlife biology	7	5	3
5	In-situ conservation	4	3	4
6	Ex-situ conservation	5	2	3
7	Policy/law/social issues	3	2	3

Standard 6-2. All faculty members must remain current in the discipline and sufficient time must be provided for scholarly activities and professional development. Also, effective programs for faculty development must be in place.

- In each semester courses are offered according to work load of faculty members
- Division of students for supervision is made on the basis of faculty expertise/research interests

Existing faculty development programs at department and university level

- Faculty members attended conferences/workshops/seminars outside and within university.
- Laboratory, library and internet facilities are available for scholarly work and academic improvement
- Support for attending conferences lead to enhancement of research initiatives.
- All faculty members got financial support for research projects from HEC and university-funded program specifically designed for junior faculty members.

Standard 6-3. All faculty members should be motivated and have job satisfaction to excel in their profession

The young faculty is mobilized by timely back up and appreciation by the senior faculty members. Avenues for research funding are provided to them through university research programme. There are programs and processes in place to attract good faculty members e.g. teaching and research awards annually, reasonable teaching load and class size, social activities and better salary package.

Results of the faculty survey

Results of faculty survey (**Performa 5**) are summarized in Fig.29. The results generally showed satisfaction of the teachers over most of parameters. However, level of monitoring, cooperation with colleagues and the cooperation of teachers needs to be improved.

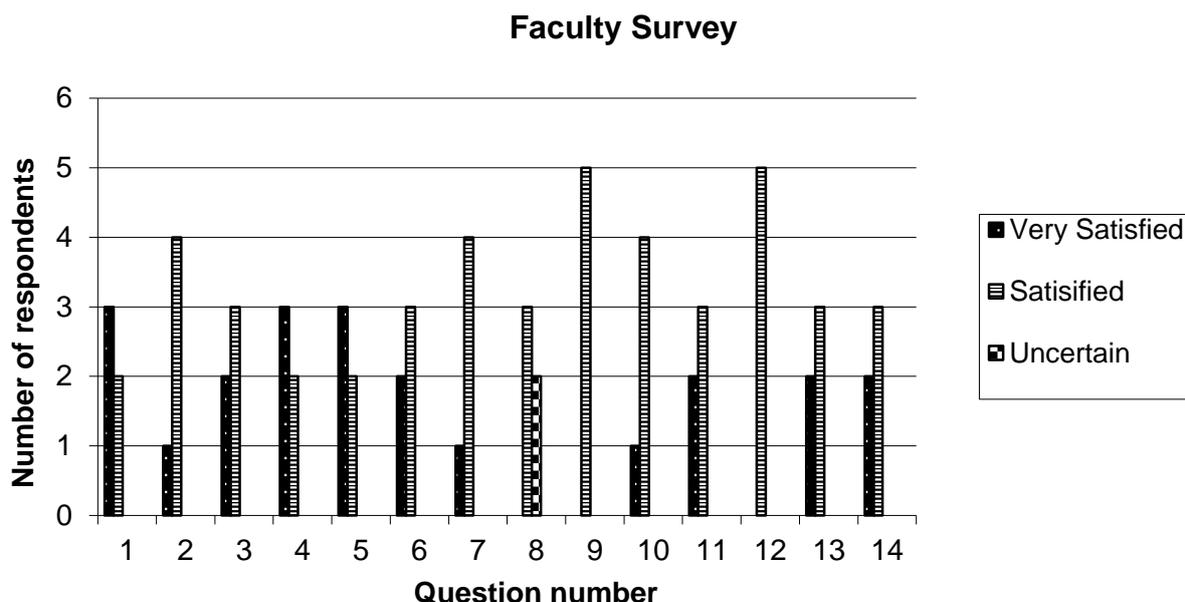


Figure29. Results of faculty survey

CRITERION 7. INSTITUTIONAL FACILITIES

Standard 7.1. The institution must have the infrastructure to support new trends in learning such as e-learning. Supportive Infrastructure and Facilities in learning:

- a. Two well-equipped laboratories and one class room with teaching aids(multimedia, over head projector) and number of books are available in the department.
- b. However, more sitting place for faculty members and Ph.D. students with computer and internet facility is desired to make working/research/study environment conducive for higher learning.

Standard- 7.2. The library must possess an up-to-date technical collection relevant to the program and must be adequately staffed with professional personnel.

- Central university library has been recently up-upgraded with provision of computer and internet facility to the post-graduate students.
- The department is regularly suggesting to the central library for provision of new books related to wildlife sciences.
- The department under its HEC funded project has purchased more than 270 books in the area of wildlife studies.
- Only a small number of scientific journals are available in the central library; even Pakistani Journals are not available. Provision of major journals related to wildlife is highly desired for research and scientific/technical writing.

Standard- 7.3. Class-rooms must be adequately equipped and offices must be adequate to enable faculty to carry out their responsibilities.

There is only one classroom with the department which possesses proper teaching facilities such as multimedia projector and overhead projector. Classroom is inadequate for all classes. Sometimes classes are taken in the laboratories. Similarly, space for faculty offices is not appropriate and two faculty members are housed in the cabins built inside the Labs. This makes Lab. space insufficient for practical and research use by the students.

CRITERION8. INSTITUTIONAL SUPPORT

The university administration is making all possible efforts for strengthening the existing departments by attracting highly qualified faculty and by getting financial support through R&D Project.

Standard 8-1. There must be sufficient support and financial resources to attract and retain high quality faculty and provide the means for them to maintain competence as teachers and scholars.

There is no proper maintenance/documentation and attractive investment of GPF deducted from salary of the employees. Similarly, no benefit/welfare from BF deduction is available to the faculty except a meager benefit for faculty children's education at university level. Similarly, little attention is being paid for faculty residential facilities at university campus and majority of faculty members remain on waiting list for a long period. Transport facility is not frequently and easily available for field works/touring. Department budget is too low to meet expenses and only Rs. 50,000/- were allocated for the year 2012-13 and 2013-14 for office and Lab. expenses including student research. However, the department can get chemicals, glassware, stationery and other office use items from central stores of university by submitting special request.

Technical Staff: Civil Works and internet networking departments are very slow in response. Financial and accounting departments are also slow in their delivery.

Office equipment: Sufficient office equipment is available to meet the current teaching and research activities of the department.

Standard 8-2. There must be an adequate number of high quality graduate students, research assistants and Ph.D. students.

The admission of M.Sc. is held once a year. Details are given in Table 10.

Table 10. Enrollment in M.Sc. degree program in 2012 and 2013

Year	Students enrolled in M.Sc
2012	7
2013	14
Total	21

Standard- 8.3. Financial resources must be provided to acquire and maintain Library holdings, laboratories and computing facilities.

An amount of Rs. 50,000/- per annum is considered sufficient to meet the needs of the department which is too low to maintain and run the departmental activities.

SUMMARY AND CONCLUSIONS

The Department of Wildlife Management at PMAS-Arid Agriculture University, Rawalpindi was established in 2007 with a mandate to carry out teaching and research in wildlife for its conservation in the country, particularly in Pothwar region. There are five faculty members out of them four having doctoral degrees and three are HEC approved supervisors. The courses have been prepared keeping in view the latest developments in wildlife management and conservation. The department is offering M.Sc., M. Phil. and Ph.D. in wildlife management. During the report period 19 students were enrolled in M.Sc. programme. The department has published more than 49 research papers during the period under report.

Basic equipment for field surveys of wildlife and its habitats has been procured through various funding sources which include binoculars, spotting scopes, global positioning system (GPS), camera, telemetry equipment, camping gear, etc. Two laboratories have been established with basic necessary equipment for micro-histological, taxonomy, food habit studies and food/diet composition. More than 270 latest books on the subject of wildlife/biodiversity have also been purchased and placed in the main library and in the department for ready reference to the students.

Young faculty members have got six research projects from the university funding programme while senior faculty has earned three research projects from HEC. The departmental reaching and research capacity has been enhanced through PSDP/HEC funded project. Research studies currently being conducted focus on wildlife population density and size, wildlife habitat analysis, food habits and diet composition, breeding habits and breeding biology, distribution patterns, data on protected areas and threatened species, wetland ecology, population trends of water birds, threats to wildlife species, wildlife damage assessment and management, etc.

Proper steps are taken to guide the students for programme requirements, communication, meetings, study tours, students-teacher interaction, etc. They are well informed of relevant scientific societies, job opportunities and other such activities. University and HEC rules and guidelines are followed for process control covering admission, registration, recruiting policy, courses and delivery of material, academic requirements, performance and grading.

Curriculum design, development and organization is based upon approved criteria. Pre-requisites are fully observed, examinations are conducted as per schedule, academic schemes are prepared and courses for each semester are developed. Their efficacy was found to range between satisfactory to highly satisfactory. Self assessment report has shown programme outcomes as satisfactory. Teachers' evaluation and course evaluation by the students' revealed highly satisfactory standards. Faculty survey results were variable but with overall satisfactory rating. Graduating students also showed their satisfaction over the knowledge being provided and research studies conducted about wildlife management in the department.

Performance of the department could be improved considering the following points.

1. There is need for refresher courses for teachers pertaining to teaching methodology, education psychology, research and developments and evaluation of students.
2. Professional and behavioral training of support staff will improve their abilities for enhancing the quality of research and teaching.
3. Advance laboratory equipments are needed to carry out molecular/DNA analysis in food habits and species verification.
4. Department budget may be increased to fulfill its requirements for purchase of chemicals, glassware and other items required for conducting of research.
5. The department is in dire need of office rooms for two faculty members, one store room, one library room, one class room and one laboratory room.
6. Regular provision of transport facility for field visits is highly desired.

Thanks

Program Team Members

1. **Prof. Dr. Maqsood Anwar (Coordinator)**
2. **Dr. Tariq Mahmood (Member)**
3. **Dr. Muhammad Rais (Member)**

1. CURRICULUM VITAE

Personal Data

Name: DR. IFTIKHAR HUSSAIN
 Present Position: Professor & Chairman; Department of Wildlife Management, Faculty of Forestry, Range management and Wildlife, PMAS-Arid Agriculture University, Rawalpindi-46300
 Telephone: 051-9291021
 E-mail: ifthussain@edu.com.pk

Academic Qualification

Degree	Year	Institution/University	Subjects
Ph.D.	1998	University of Reading, UK.	Rodent Management
M. Phil.	1990	Quaid-i-Azam University, Islamabad.	Endocrinology
M.Sc.	1979	University of Punjab, Lahore	Zoology
Post-Graduate Diploma	1986	Karachi University, Karachi	Statistics

Publications during 2012-2014

- 1) **Hussain, I.**, A. Nisa and S. Khalil. 2012. Population Biology of Grey Francolin (*Francolinus pondicerianus*) in Agro-Ecosystem of Pothwar Plateau, Pakistan. *Chinese Birds*, 3(2):91-102 China, DOI 10.5122/cbirds.2012.0009 (*Citation: 1*).
- 2) Rais, M., S. Baloch, J. Rehman, M. Anwar, **I. Hussain** and T. Mehmood. 2012. Diversity and conservation of amphibians and reptiles in north Punjab, Pakistan. *The Herpetological Bulletin* (UK), 122:16-25 (*Citation: 1*).
- 3) Mushtaq, M., **I. Hussain**, A. Mian, S. Munir, I. Ahmad and A.A. Khan. 2013. Field evaluation of some bait additives against Indian crested porcupine, *Hystrix indica* Kerr (Rodentia: Hystricidae). *Integrative Zoology*, 8: 285-292. DOI:10.1111/1749-4877.12014 (IF: **1.0**, *Citation: 3*).
- 4) Bilal, S., M. Rais, M. Anwar, **I. Hussain**, M. Sharif and B. Kabeer. 2013. Habitat association of Little Grebe (*Tachybaptus ruficollis*) at KallarKahar Lake, Pakistan. *Journal of King Saud University-Science*, 25:267-270.
- 5) **Hussain, I.**, S. Abbasi, S. N. Mirza, M. Anwar, M. Rais, T. Mahmood. 2013. Tree cavities and associated vertebrate fauna in coniferous forest of Dhirkot, Azad Jammu and Kashmir part of Pakistan. *Turkish Journal of Zoology*, 37: 647-658. doi:10.3906/zoo-1209-32. (IF: **0.591**)
- 6) Sarwar, M., **I. Hussain**, A. Khan and M. Anwar. 2013. Diet composition of demoiselle crane (*Anthropoidesvirgo*) migrating through LakkiMarwat area of Pakistan. *Avian Biology Research*, 6(4): 269-274. DOI:<http://dx.doi.org/10.3184/175815513X13802893287049> (IF: **0.674**, *Citation: 1*).
- 7) Rakha, B.A., **I. Hussain**, S. Akhtar, N. Ullah, S.M.H. Andrabi and M.S. Ansari. 2013. Evaluation of Tris-citric acid, skim milk and sodium citrate extenders for liquid storage of Punjab Urial (*Ovisvigneipunjabiensis*) spermatozoa. *Reproductive Biology*, 13: 238-242. <http://dx.doi.org/10.1016/j.repbio.2013.06.004> (IF: **1.222**, *Citation: 1*).
- 8) Ashraf, N., M. Anwar, **I. Hussain** and M.A. Nawaz. 2014. Competition for food between the markhor and domestic goat in Chitral, Pakistan. *Turkish Journal of Zoology*, 38: 191-198. doi:10.3906/zoo-1306-6. (IF: **0.591**, *Citation: 1*)
- 9) Rais, M., J. Rehman, S. Baloch, S. M. Ali and **I. Hussain**. 2014. On the herpetofauna in LoiBher Wildlife Park, Rawalpindi, Pakistan. *TAPROBANICA*, 6(1): 56-58.
- 10) Mushtaq, M., **I. Hussain** and A. Mian. 2012. Effectiveness of groundnut-maize bait as carrier of coumatetralyl against Indian crested porcupine, *Hystrix indica* Kerr. *Pakistan Journal of Zoology*, 44(2):579-581. (IF: **0.338**, *Citation: 2*).

- 11) Mahmood, T., R. Hussain, M. Rais, **I. Hussain** and M.S. Nadeen. 2012. Habitat analysis and population estimates of three falcon species, Red-headed Merlin (*Falco chicauera*), Common Kestrel (*Falco tinnunculus*) and Saker Falcon (*Falco cherritg*), inhabiting district Chakwal, Pakistan. *Pakistan Journal of Zoology*, 44(3):787-798. (IF: **0.338**).
- 12) Khan, A.A., S. Munir and **I. Hussain**. 2012. Evaluation of in-burrow baiting technique for control of rodents in groundnut crop. *Pakistan Journal of Zoology*, 44(4):1035-1039. (IF: **0.338**)
- 13) Mehmood, A., M. S. Ansari, S. Akhter, A. A. Khan, **I. Hussain**, Shams-ul-Hassan, T. Z. Qureshi and B. A. Rakha. 2012. Occurrence of pathogenic bacteria in small mammals-inhabiting poultry aarms of Rawalpindi/Islamabad, Pakistan. *Pakistan Journal of Zoology*, 44 (4): 1185-1187 (IF: **0.338**, Citation: **I**).

2. CURRICULUM VITAE

Personal Data

Name: Dr. MAQSOOD ANWAR
 Present Address: Professor, Department of Wildlife Management, PirMehr Ali
 Shah Arid Agriculture University, Murree road, Rawalpindi, Pakistan.
 Telephone 0334-5434784
 E-mail maqsoodanwar@uair.edu.pk

Academic Qualification

Degree	Year	Institution	Specialization
Ph.D.	1989	Utah State University, Logan Utah, USA	Wildlife Science
M.Sc.	1982	University of Agriculture, Faisalabad, Pakistan	Zoology
B.Sc.	1978	Punjab University, Lahore, Pakistan	Biological Sciences

Publications during 2012-2014

1. Nasra Ashraf, **Maqsood Anwar**, Iftikhar Hussain and Muhammad Ali Nawaz. 2014. Competition for food between the markhor and domestic goat in Chitral, Pakistan. *Turk J. Zool.*, 38: 191-198. (IF: **0.591**, Citation: **I**)
2. Sajida Noureen, Muhammad Sajid Nadeem, Mirza Azhar Beg and **Maqsood Anwar**. 2014. Seasonal variation in the reproductive tract of the Indian flying fox, *Pteropus giganteus*(Brünnich, 1782). *Anim. Bio.*, 64: 343–364.
3. Muhammad Kabir, Muhammad Siddique Awan and **MaqsoodAnwar**. 2013. Distribution status of common leopard (*Panthera pardus*) in and around Machiara National Park, Azad Jammu and Kashmir. *Int. J. Cons. Sci.*, 4(1):3-12.
4. Noman Khalique, Muhammad Rais, Tariq Mehmood, **Maqsood Anwar**, Sakhawat Ali, Sadia Bilal, Bilal Kabeer. 2012. Study on some waterfowls of Mangla Dam, Azad Jammu and Kashmir. *Беркыт* 21(1-2): 44 – 49.
5. MisbahSarwar, Iftikhar Hussain, Ahmad Khan and **Maqsood Anwar**. 2013. Diet composition of the Demoiselle Crane (*Anthropoidesvirgo*) migrating through LakkiMarwat, Pakistan. *Avian Bio. Res.*, 6(4): 2013. (IF: **0.674**, Citation: **I**).
6. Sara Shabbir, **Maqsood Anwar**, Iftikhar Hussain and Muhammad Ali Nawaz. 2013. Food habits and diet overlap of two sympatric carnivore species in Chitral, Pakistan. *J. Anim. Plant Sci.*, 23(1):100-107. (Impact factor=**0.638**)
7. Baseer u Din Qureshi, **Maqsood Anwar**, Iftikhar Hussain and Mirza Azhar Beg. 2013.Habitat utilization of Himalayan Musk deer (*Moschuschrysogaster*) in the Musk Deer National Park Guraiz, Azad Jammu and Kashmir, Pakistan. *J. Anim. Plant Sci.*, 23(5): 2013: 1366-1369. (Impact factor=**0.638**)
8. Muhammad Rais, Sara Baloch, JeveriaRehman, **Maqsood Anwar**, Iftikhar Hussain and Tariq Mahmood. 2012. Diversity and Conservation of Amphibians and Reptiles in North Punjab, Pakistan. *Herpeto. Bulletin*. 18:16-25.

9. Iftikhar Hussain, Sajid Abbasi, SarwatNaz Mirza, **Maqsood Anwar**, Muhammad Rais and Tariq Mahmood. 2013. Tree cavities and associated vertebrate fauna in a coniferous forest of Dhirkot, Azad Jammu and Kashmir part of Pakistan. Turk. J. Zool., 37: 647-658. **(IF: 0.591)**
10. Sadia Bilal, Muhammad Rais, **Maqsood Anwar**, Iftikhar Hussain, Madiha Sharif and Bilal Kabeer. 2013. Habitat association of Little Grebe (*Tachybaptusruficollis*) at KallarKahar Lake, Pakistan. J. King Saud Univ. – Sci., 25(3):267-270.
11. **Anwar**, M., M. Arshadullah, A. S. Rana and S. Maqsood. 2012. Evaluating the performance of Australian annual medics in sub-tropical and sub-humid ecological zones of Pakistan. Pak. J. Agri. Sci., 49(2):185-188. **(IF: 1.058)**
12. Arshadullah,M., **M. Anwar**, S. N. Mirza and M. Rasheed. 2012. Forage production and nutritional quality of grasses in mesic climate of Pothwar plateau, Rawalpindi. J. Anim. Plant Sci, 22(3):781-784. **(Impact factor=0.638)**
13. Qamar, Z. Q., U. Ali, R. A. Minhas. N. I. Dar and **M. Anwar**.2012. New Distribution Information on Woolly Flying Squirrel (*Eupetauruscinereus*Thomas, 1888) in Neelum Valley of Azad Jammu and Kashmir, Pakistan. Pak. J. Zool., 44(5):1333-134. **(IF: 0.309)**

3. Curriculum Vitae

Personal Details:

Nme: Dr. Tariq Mahmood

Present position and Address: Assistant Professor, Department of Wild life Management, PMAS Arid Agriculture University,Rawalpindi 46300, Pakistan

Contact No. Cell #: 0313-5307794; Office: 051-9291021

E-mail address: tariqjanjua75@uaar.edu.pk.

Academic Qualification:

Degree	Year	Subject	Institution
Ph.D.	2009	Animal Physiology	QAU Islamabad
M.Phil.	2002	Animal Physiology	QAU Islamabad
M.Sc.	1994	Zoology	PU Lahore

List of Publications 2012-2014

1. **Tariq Mahmood**, NausheenIrshad, and Riaz Hussain. **2014**. Habitat preference and population estimates of Indian pangolin (*Manis crassicaudata*) in district Chakwal of Potohar Plateau, Pakistan. Russian Journal of Ecology, 45(1): 70-75. **(Citation: 01) (IF: 0.236)**
2. Muhammad Awais, Shabbir Ahmed, Sajid Mahmood, Azhar Mahmood, Shaukat Ali, Komal Bibi and **Tariq Mahmood**.**2014**.Nest Density, Clutch Size and Egg Traits of House Crow *Corvus splendens* at Ghazikot Township, Mansehra, Pakistan.The Journal of Zoology Studies. 1(5): 13-18. **(IF: 0.31)**
3. Muhammad Sajid Nadeem, **Tariq Mahmood**, Muhammad Mahmood-ul-Hassan. **2014**. Breeding success of the Stone Curlew *Burhinusoedicnemus* in Nag Valley (1999–2001), Kharan, Pakistan. Turkish Journal of Zoology, 38: 510-514.**(IF: 0.414)**.
4. Iftikhar Hussain, Sajid Abbasi, SarwatNaz Mirza, Maqsood Anwar, Muhammad Rais, **Tariq Mahmood**. **2013**. Tree cavities and associated vertebrate fauna in a coniferous forest of Dhirkot, Azad Jammu and Kashmir part of Pakistan. Turkish Journal of Zoology,37: 647-658. **(IF: 0.414)**
5. ShaguftaNighat, Shahid Iqbal, Muhammad Sajid Nadeem, **Tariq Mahmood** and Syed Israr Shah. **2013**. Estimation of heavy metal residues from the feathers of Falconidae, Accipitridae and Strigidae in Punjab, Pakistan. Turkish Journal of Zoology, 37(4): 488-500. **(Citations: 02) (IF: 0.414)**

6. **Tariq Mahmood**, Syed Muhammad Usman-ul-Hassan, Muhammad Sajid Nadeem and Amjad Rashid Kayani. **2013**. Population and Diet of migratory Common Starling *Sturnus vulgaris* wintering in agricultural areas of Sialkot district, Pakistan. The Forktail, 29: 143-144.
7. Muhammad Rais, Sara Balouch, Javeria Rehman, Maqsood Anwar, Iftikhar Hussain and **Tariq Mahmood**. **2012**. Diversity and Conservation of amphibians and reptiles in north Punjab, Pakistan. Herpetological Bulletin. 122: 16-25.
8. Muhammad Sajid Nadeem, Ruqyya Naz, Syed Israr Shah, Mirza Azhar Beg, Amjad Rashid Kayani, Muhammad Mushtaq and **Tariq Mahmood**. **2012**. Season- and locality-related changes in the diet of Asiatic Jackal (*Canis aureus*) in Potohar, Pakistan. Turk. J. Zool. 2012. 36: 798-805. **(Citation: 01) (IF: 0.414)**
9. Noman Khalique, Muhammad Rais, **Tariq Mahmood**, Maqsood Anwar, Sakhawat Ali, Sadia Bilal, Bilal Kabeer. **2012**. Study on Some waterfowls of mangla dam, Azad Jammu and Kashmir. BERKUT. 21(1-2): 44-49.
10. **Tariq Mahmood**, Khalida Jabeen, Iftikhar Hussain and Amjad Rashid Kayani. **2013**. Plant species association, burrow characteristics, and the diet of Indian pangolin *Manis crassicaudata* in the Potohar Plateau, Pakistan. **Pakistan Journal of Zoology**, 45(6):1533-1539. **(IF: 0.309)**
11. **Tariq Mahmood**, Fouzia Niazi, and Muhammad Sajid Nadeem. **2013**. "Diet composition of Asiatic jackal (*Canis aureus*) in Margallah Hills National Park, Islamabad, Pakistan". The JAPS. 23(2): 444 – 456. **(IF: 0.638)**
12. **Tariq Mahmood**, Riaz Hussain, Nausheen Irshad, Faraz Akrim and Muhammad Sajid Nadeem. **2012**. Illegal Mass Killing of Indian Pangolin (*Manis crassicaudata*) in Potohar Region, Pakistan. Pak. J. Zool., 44(5), 1457-1461. **(Citation: 01) (IF: 0.309)**
13. **Tariq Mahmood**, Muhammad Khaled Siddiq, Muhammad Rais and Muhammad Sajid Nadeem. **2012**. Distribution and abundance of freshwater turtles in Korang River Islamabad-Rawalpindi, Pakistan. Pakistan J. Zool. 44 (3): 889-893. **(Citation: 01) (IF: 0.309)**
14. **Tariq Mahmood**, Riaz Hussain, Muhammad Rais, Iftikhar Hussain and Muhammad Sajid Nadeem. **2012**. Habitat Analysis and Population Estimates of three falcon species, Red-headed Merlin (*Falco chicquera*), Common Kestrel (*Falco tinnunculus*) and Saker Falcon (*Falco cherrug*), inhabiting district Chakwal, Pakistan. Pakistan J. Zool. 44(3):787-79. **(Citations=03) (IF: 0.309)**

4. Curriculum Vitae

Muhammad Rais

Position/Address: Assistant Professor (Wildlife Management), Department of Wildlife Management, PMAS-Arid Agriculture University Rawalpindi, Pakistan. 46000.
 Cell: 011-92-332-5442050
 Email: sahil@uaar.edu.pk

Academic Qualifications

Ph. D.	Karachi University	2012	---
M. Sc.	Karachi University	2004	1 st Position
B. Sc. (Hon.)	Karachi University	2003	1 st Division
F. Sc.	Karachi Board	2000	1 st Division
Matric	Karachi Board	1998	1 st Division

Publications during 2012-2014

1. **Rais, M.**, Rehman, J., Baloch, S., Ali, S. M. and Hussain, I. 2014. On the herpetofauna in LoiBher Wildlife Park, Rawalpindi, Pakistan. *Taprobanica*. 6 (1): 56–58.
2. **Rais, M.**, Abbassi, S., Batool, T., Jilani, M.J., Assadi, M.A., Mubarak, H. and Baloch, S. 2014. A note on recapture of *Nanoranavicina* (Anura: Amphibia) from Murree, Pakistan. *Journal of Animal and Plant Sciences Lahore*. 24(2): 455-458. (**Impact Factor=0.638**).
3. **M. Rais**, M. Z. Khan, S. A. Ghalib, R. Nawaz, G. Akbar, S. L. Islam and A. Begum. 2013. Global conservation significance of Chotiari Wetlands Complex, Sanghar, Sindh, Pakistan. *Journal of Animal and Plant Sciences*. 23(6): 1609-1617. (**Impact factor=0.638**)
4. Hussain, I., Abbassi, S., Mirza, S.N., Anwar, M., **Rais, M.** and Mahmood, T. 2013. Tree cavities and associated vertebrate fauna in a coniferous forest of Dhirkot, Azad Jammu and Kashmir part of Pakistan. *Turkish Journal of Zoology*. 37: 647-658. (**Impact factor=0.414**)
5. Bilal, S., **Rais, M.**, Anwar, M., Hussain, I., Sharif, M. and Kabeer, B. 2013. Habitat Association of Little Grebe (*Tachybaptus ruficollis*) at KallarKahar Lake, Pakistan. *Journal of King Saud University-Science (Elsevier)*. 25:267-270.
6. Khalique, M., **Rais, M.**, Mehmood, T., Anwar, M., Ali, S., Bilal, S. and Kabeer, B. 2012. Study on some waterfowls of Mangla Dam, Azad Jammu and Kashmir. *Berkut*. 21 (1-2): 44-49.
7. **Rais, M.**, Baloch, S., Rehman, J., Anwar, M., Hussain, I. and Mehmood, T. 2012. Diversity and conservation of amphibians and reptiles in North Punjab, Pakistan. *Herpetological Bulletin*. 122: 16-25.
8. Mehmood, T., Hussain, R., **Rais, M.**, Hussain, I. and Nadeem, M.S. 2012. Habitat Analysis and Population Estimates of Three Falcon Species, Red-headed Merlin (*Falco chicquera*), Common Kestrel (*Falco tinnunculus*) and Saker Falcon (*Falco cherrug*), Inhabiting District Chakwal, Pakistan. *Pakistan Journal of Zoology*. 44 (3): 787-798. (**Impact factor=0.309**) (**Citations=03**)
9. Mehmood, T., Siddiq, M.K., **Rais, M.** and Nadeem, M.S. 2012. Distribution and Relative Abundance of Freshwater Turtles in Korang River Islamabad- Rawalpindi, Pakistan. *Pakistan Journal of Zoology*. 44 (3): 889-893. (**Impact factor=0.309**)

5. Curriculum Vitae

Personal Information

Name: Bushra Allah Rakha, Lecturer (Wildlife Management)
Address: Department of Wildlife Management, PirMehr Ali Shah, Arid Agriculture University
Rawalpindi-46300, Pakistan
Contact No. Mobile: +92-3336341607
Office No: +92-51-9291021
E-mail: arbushra@uar.edu.pk, bushrauar@gmail.com

ACADEMIC EDUCATION:			
<u>Institution</u>	<u>Degree/Certificate</u>	<u>Major Subject</u>	<u>Division</u>
PirMehr Ali Shah Arid Agriculture University, RWP	Master of Philosophy	Wildlife Management	1 st Division 3.24/4
University of Arid Agriculture, Rawalpindi	Master of Science	Zoology	1 st Division 3.21/4
Allama Iqbal Open University, Islamabad	Bachelor of Education	Zoology, Chemistry	1 st Division

Government Degree College for women, Hasilpur	Bachelor of Science	Zoology, Botany Chemistry	1 st Division
Government Degree College for women, Hasilpur	Higher Secondary school Certificate	Pre-Medical	1 st Division
Government Girls High School No:1, Hasilpur	Secondary School Certificate	Science	1 st Division

Publications during 2012-2014

1. S. Akhter, M. S. Ansari, S. M. H. Andrabi, **Bushra Allah Rakha**, N. Ullah, M. Khalid. 2012. Soya-lecithin in extender improves the freezability and fertility of buffalo (*Bubalus bubalis*) bull spermatozoa. *Reprod. Domestic Anim.*, 47: 815-819.
2. Ansari, M. S., **Bushra Allah Rakha**, S. M.H. Andrabi, N.Ullah, R. Iqbal, W. V. Holt, S. Akhter. 2012. Glutathione-supplemented tris-citric acid extender improves the post-thaw quality and in vivo fertility of buffalo (*Bubalus bubalis*) bull spermatozoa. *Reprod. Bio.*, 12: 271-276.
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