



SATPUDA EDUCATION SOCIETY, JALGAON JAMOD'S

Arts & Commerce College

Warwat Bakal Tq. Sangrampur Dist - Buldhana (M.S.)

NAAC Reaccredited with 'B' Grade

- Principal -

Dr. Shiram Yerankar

M.A., M.Phil, Ph.D.

9423722316

College Code : 327

- President -

Shri. Krushnarao Ingle

(Ex. M.L.A.)

07266-221449

Website : www.acscwb.co.in

E-mail : 327accwb@gmail.com

Criterion VI- Governance, Leadership and Management

6.5 Internal Quality Assurance System

6.5.3 Quality assurance initiatives of the institution include

Metric No.	Sr. No.	Content / File Description
6.5.3	A	IQAC Meetings
	B	Feedback
	C	Quality Audits

IQAC Co-ordinator
Arts and Commerce College,
Warwat Bakal



Principal
Arts & Commerce College,
Warwat Bakal Dist. Buldhana



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CERTIFICATE

This is to certify that the documents attached as supporting documents for **Criterion VI- Governance, Leadership and Management** are verified from the college record and found to be correct to the best of my knowledge.

IQAC Co-ordinator
Arts and Commerce College,
Warvat Bakal



Principal
Arts & Commerce College,
Warvat Bakal Dist. Buldana

A. IQAC Meetings

SATPUDA EDUCATION SOCIETY, JALGAON (JAMOD)'S

ARTS AND COMMERCE COLLEGE

Warvat Bakal Dist- Buldana

(NAAC ACCREDITED WITH 'B' GRADE : CGPA 2.27)

Dr. Rajendra Korde
I/C Principal

Shri Krushnarao Ingle (Ex MLA)
President

Phone : 07266-237126

visit us at : www.ascw.com

Email : 327accwb@gmail.com

MINUTES OF THE 28th MEETING OF INTERNAL QUALITY ASSURANCE CELL (IQAC)



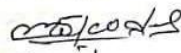


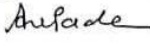





Date: 3rd August, 2022

Time: 10.00 a.m.

Venue : IQAC

Members Present:

1. Dr. Rajendra Korde, Chairman, IQAC 
2. Dr. Swatitai Wakekar, Management Representative 
3. Mr. Sunil Makode, Teacher Representative 
4. Dr. Sanjay Tale, Teacher Representative 
5. Dr. Megha Solanke Teacher Representative 
6. Mr. Ajay Chopade, Administrative Representative 
7. Mr. Vijay Samadhan Gaigol, (Representative from Industry & Commerce)
8. Mr. Pankaj Tayade (Alumni Representative) 
9. Ku. Nanda Vitthal Dabre (Students' Representative) 
10. Mr. Nishigandh Satav, Co-ordinator, IQAC 

Agenda 1/28: Approval to the Minutes of 27th Meeting of Internal Quality Assurance Cell held on 23rd April, 2022

Resolution 1/28: Mr. N.P. Satav, Coordinator, IQAC presented the minutes of the IQAC Meeting held on 23/04/2022 which were unanimously approved.

Agenda 2/28: Review of the proposal of PG courses –

Resolution 2/28: As resolved in the previous meeting regarding PG courses to be started from the session 2022-23, Dr. Rajendra Korde told the house that all the PG courses were sanctioned by the government.

Agenda 3/28: Discussion on recruiting the teachers for PG courses.

Resolution 3/27: It was thoroughly discussed to appoint the eligible teachers for the MA (Economics), MA (Political Science), M.Com., M.Sc. (Chemistry, Botany & Zoology). The HoDs of the concerned departments be informed to get the required workload so as to appoint the teachers.

Agenda 4/28: Academic Planning for the session 2022-23.

Resolution 4/28: Dr. Sanjay Tale put before the House the details of CBCS (New) pattern to be implemented from 2022-23. It was unanimously resolved to get updated regarding the new pattern of syllabus.

Agenda 5/28: Subjects with prior permission of Chairman.

Resolution 5/28: There being no issue to discuss and being no business at hand, the meeting was adjourned.

Prepared and circulated by –


IQAC Co-ordinator
Arts and Commerce College,
Warvat Bakal




Principal
Arts & Commerce College,
Warvat Bakal Dist. Buldana

SATPUDA EDUCATION SOCIETY, JALGAON (JAMOD)'S

ARTS AND COMMERCE COLLEGE

Warvat Bakal Dist- Buldana

(NAAC ACCREDITED WITH 'B' GRADE : CGPA 2.27)

Dr. Subhash Pawar
I/C Principal

Shri Krushnarao Ingle (Ex MLA)
President

Phone : 07266-237126

visit us at : www.asccw.com

Email : 327accwb@gmail.com

MINUTES OF THE 29th MEETING OF INTERNAL QUALITY ASSURANCE CELL (IQAC)

Date: 20th March, 2023

Time: 01.00 p.m.

Venue : IQAC



Members Present:

1. Dr. Subhash Pawar, Chairman, IQAC
2. Dr. Swatitai Wakekar, Management Representative
3. Mr. Sunil Makode, Teacher Representative
4. Dr. Sanjay Tale, Teacher Representative
5. Dr. Megha Solanke Teacher Representative
6. Mr. Ajay Chopade, Administrative Representative
7. Mr. Vijay Samadhan Gaigol, (Representative from Industry & Commerce)
8. Mr. Pankaj Tayade (Alumni Representative)
9. Ku. Nishigandha Ishwar Wankhade (Students' Representative)
10. Dr. Nishigandh Satav, Co-ordinator, IQAC

Agenda 1/29: Approval to the Minutes of 28th Meeting of Internal Quality Assurance Cell held on 3rd August, 2022.

Resolution 1/29: Dr. N.P. Satav, Coordinator, IQAC presented the minutes of the IQAC Meeting held on 03/08/2022 which were unanimously approved.

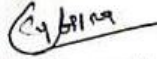
Agenda 2/29: Discussion on preparation of SSR for second cycle of NAAC –

Resolution 2/29: Dr. Nishigandh Satav told the House that IIQA was submitted on 16/03/2023. He informed the IQAC members regarding the steps to be taken so as to prepare a good SSR. So, it was unanimously resolved to be very cautious and alert about the deadline of submitting SSR. As soon as the IIQA is approved, all the faculty members would start collecting required data.

Agenda 3/29: Subjects with prior permission of Chairman.

Resolution 3/29: There being no issue to discuss and being no business at hand, the meeting was adjourned.

Prepared and circulated by –



IQAC Co-ordinator
Arts and Commerce College,
Warvat Bakal
Co-ordinator



Principal
Arts & Commerce College,
Warvat Bakal Dist. Buldana
Chairman, IQAC

B.Feedback

FEEDBACK ANALYSIS OF ZOOLOGY DEPARTMENT 2022-2023

Abbreviation of teachers used while submitting feedback

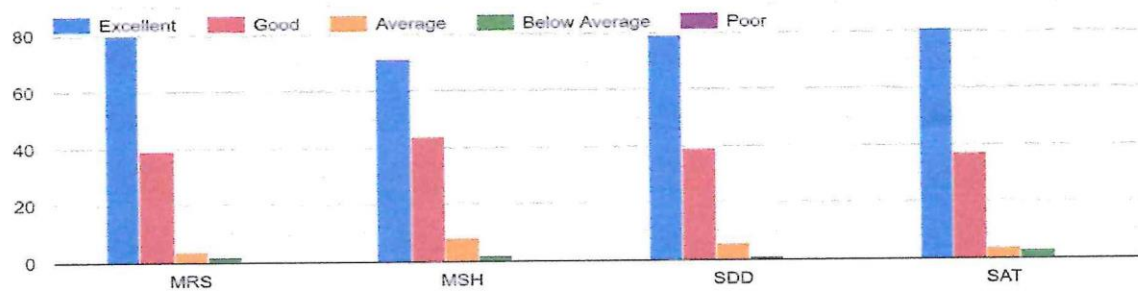
DR. MEGHA RANJIT SOLANKE : MRS

DR. MADHURI SUDHAKAR HINGANKAR : MSH

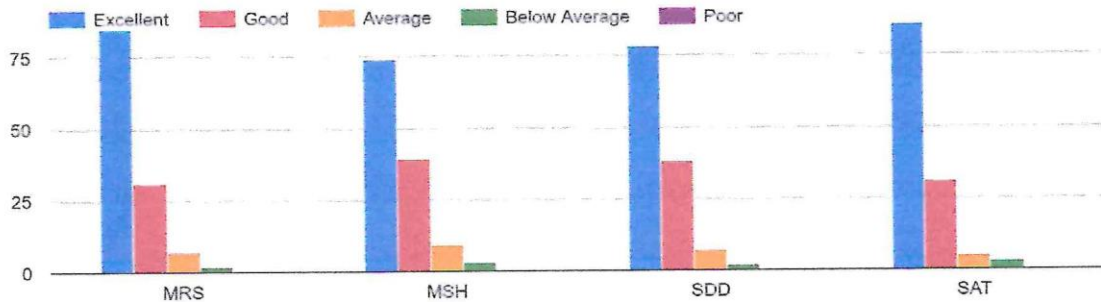
MR. SUSHIL DESHMUKH : SDD

MS. SONALI A TAYADE : SAT

Teaching Style and Clarity: Q.1. How would you rate the teacher's knowledge of the subject matter?



Teaching Style and Clarity: Q.2. How would you describe the teacher's overall teaching style?

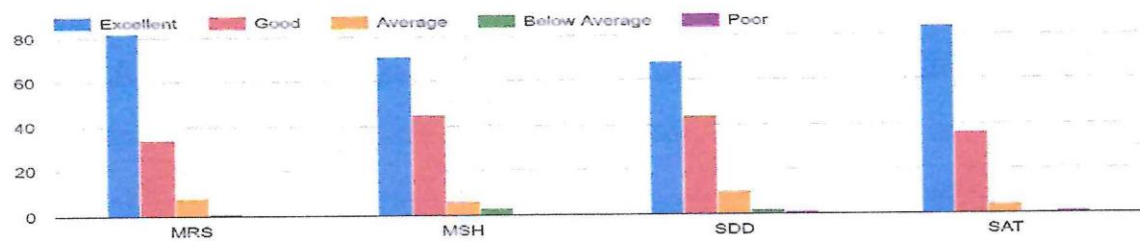


Based on the above graph regarding students' response towards the first statement, how would you rate the teacher's knowledge of the subject matter and second statement how would you describe the teacher's overall teaching style in terms of teaching style and clarity it may be concluded that on an average 72 respondents are stating that teacher's knowledge of the subject matter and teacher's overall teaching style is excellent.

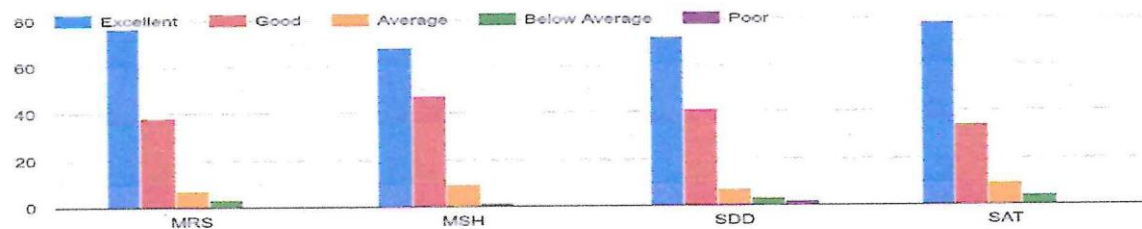


Suf
Principal
Arts & Commerce College
Warvat Bakal Dist. Buldana

Teaching Style and Clarity: Q.3. Were the concepts explained clearly and in a manner that was easy to understand?

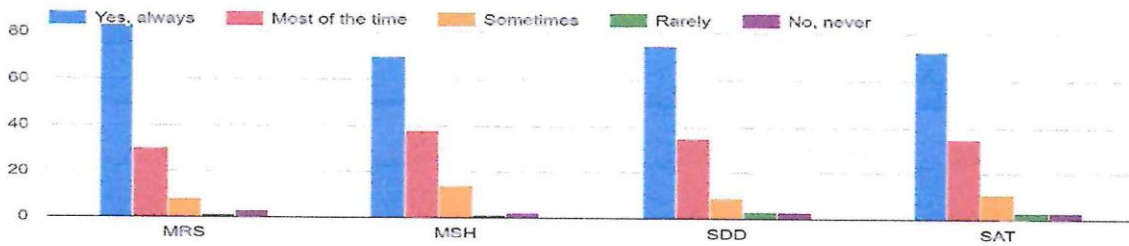


Engagement and Interaction: Q.4. Did the teacher encourage student participation and engagement in class?

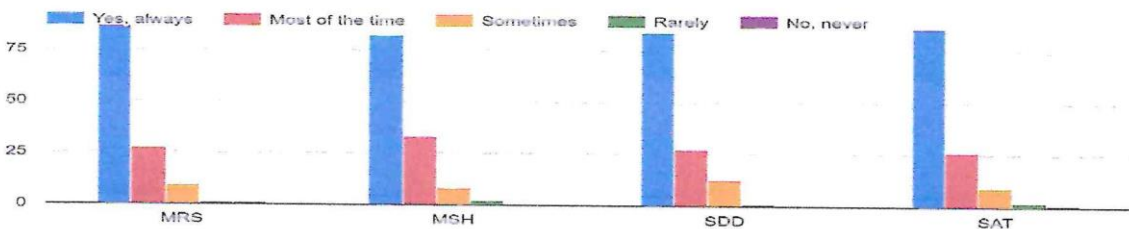


Based on the above graph regarding students' response towards the third statement, were the concepts explained clearly and in a manner that was easy to understand in terms of teaching style and clarity and fourth statement did the teacher encourage student participation and engagement in class, in terms of engagement and interaction, it may be concluded that on an average 75 respondents are stating that teacher's explained clearly and in a manner that was easy to understand them and teacher's encourage student participation and engagement in class is excellent.

Engagement and Interaction: Q.5. Were there opportunities for discussion, questions, and debates?

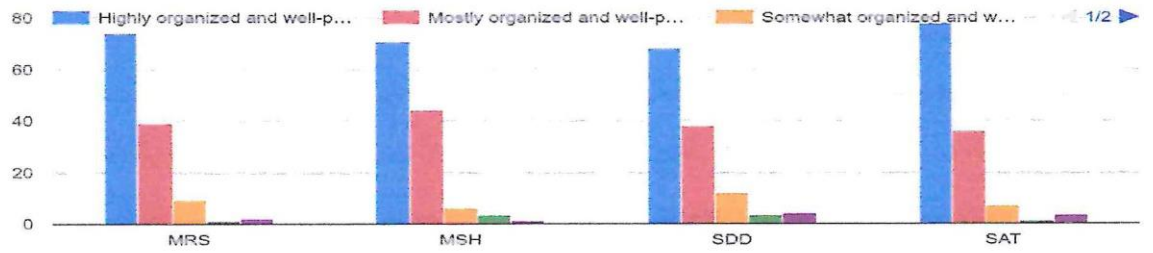


Engagement and Interaction: Q.6. Did the teacher create a supportive and inclusive learning environment?

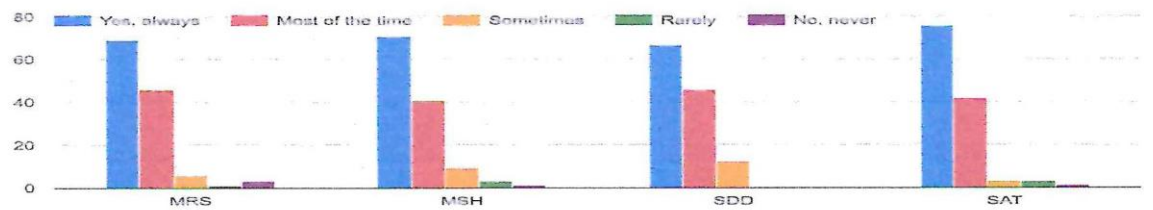


Based on the above graph regarding students' response towards the fifth statement, were there opportunities for discussion, questions, and debates in terms of engagement and interaction and sixth statement, did the teacher create a supportive and inclusive learning environment, in terms of engagement and interaction, it may be concluded that on average 72 respondents are stating that teacher's gave them opportunities for discussion, questions, and debates in terms of engagement and interaction and teachers create a supportive and inclusive learning environment that is excellent.

Organization and Preparation: Q.7. How organized and well-prepared is the teacher for classes?

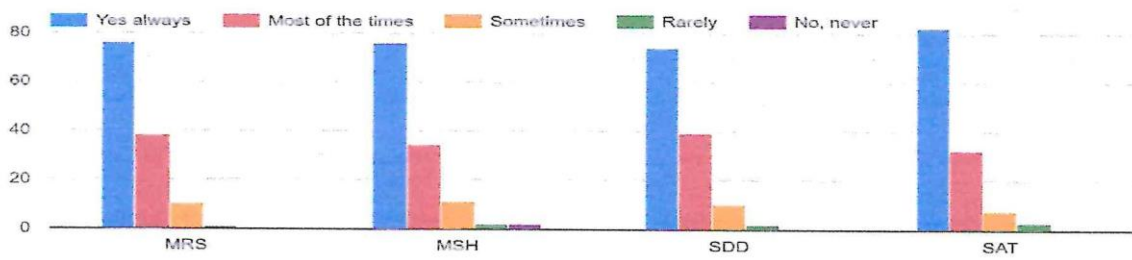


Organization and Preparation: Q.8. Were the lectures well-structured and coherent?

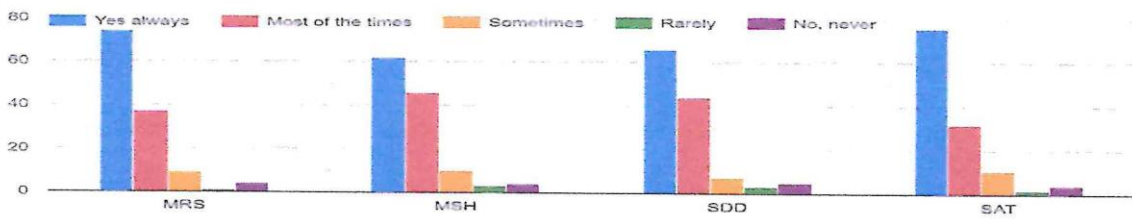


Based on the above graph regarding students' response towards the seventh statement, how organized and well-prepared is the teacher for classes and eighth statement were the lectures well-structured and coherent, in terms of organization and preparation, it may be concluded that on an average 70 respondents are stating that teachers are organized and well-prepared for classes and lectures were well-structured and coherent, in terms of organization and preparation that is excellent.

Organization and Preparation: Q.9. Did they provide relevant learning resources and materials?

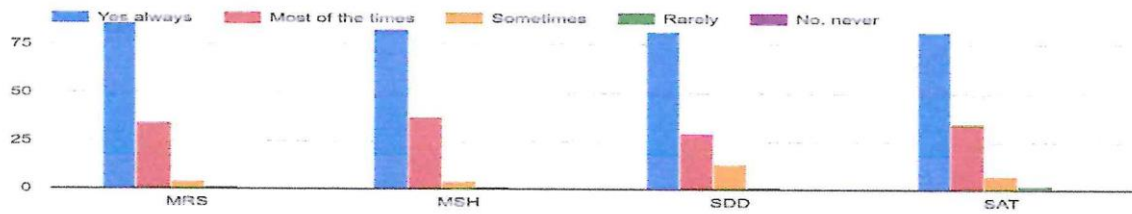


Availability and Support: Q.10. Was the teacher accessible outside of class for questions or assistance?

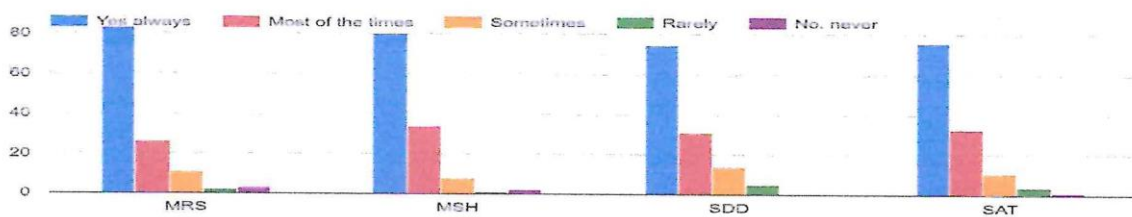


Based on the above graph regarding students' response towards the ninth statement, did they provide relevant learning resources and materials in terms of organization and preparation and tenth statement was the teacher accessible outside of class for questions or assistance, in terms of availability and support, it may be concluded that on an average 70 respondents are stating that teachers provide relevant learning resources and materials in terms of organization and preparation and teacher accessible outside of class for questions or assistance, in terms of availability and support is excellent.

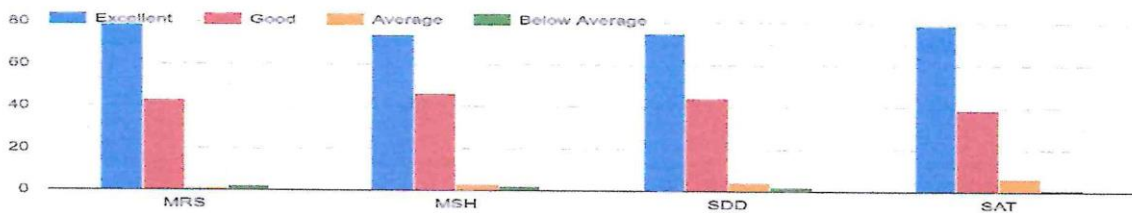
Availability and Support: Q.11.Did they provide helpful feedback on assignments and exams?



Availability and Support: Q.12.Did they respond to your inquiries in a timely manner?



Overall Experience: Q.13. Rate the overall performance of the teachers



Based on the above graph regarding students' response towards the eleventh statement, did they provide helpful feedback on assignments and exams and twelfth, did they respond to your inquiries in a timely manner, in terms of availability and support, and also thirteenth statement on an average rating the overall performance of the teachers it may be concluded that on an average 72 respondents are stating that teachers provide helpful feedback on assignments and exams and teacher respond to their inquiries in a timely manner, in terms of availability and support is excellent, while 75 respondents are stating that overall performance of the teachers is excellent.

FEEDBACK ANALYSIS OF BOTANY DEPARTMENT 2022-2023

Abbreviation of teachers to be used while submitting feedback

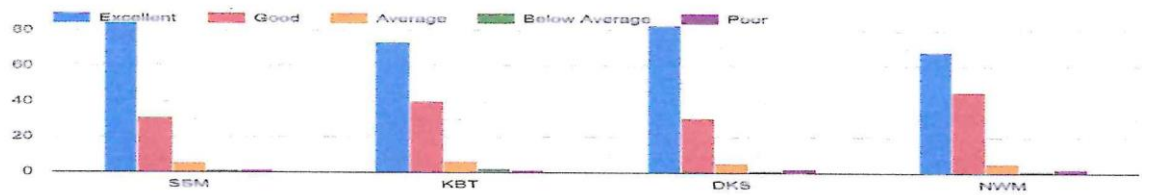
MR SANTOSH S MHASAL: SSM

DR. KISHOR BHASKAR THENG: KBT

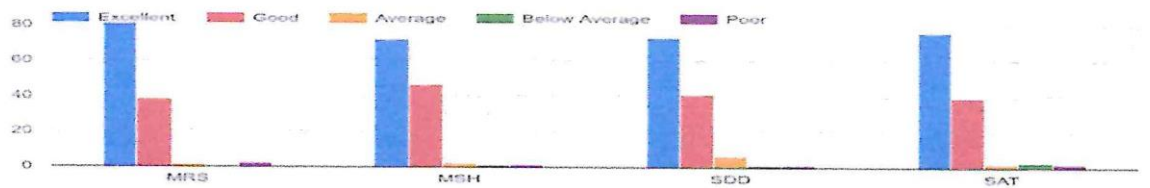
DR. DNYANESHWAR K SHERKAR: DKS

DR. NANDKISHOR K MORE : NWM

Teaching Style and Clarity: Q.1. How would you rate the teacher's knowledge of the subject matter?

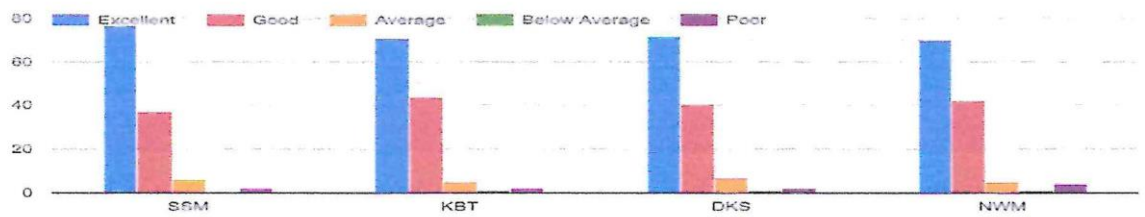


Teaching Style and Clarity: Q.2. How would you describe the teacher's overall teaching style?

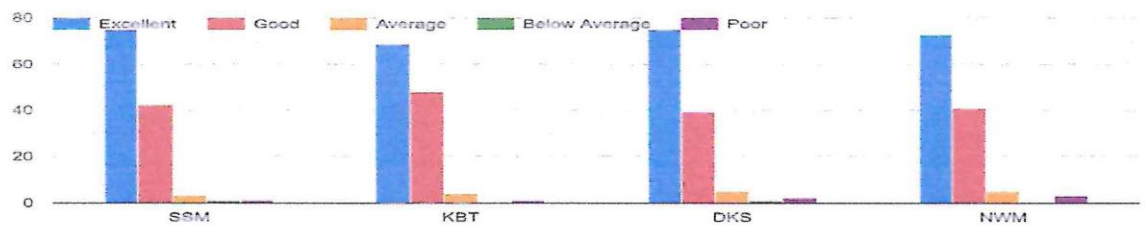


Based on the above graph regarding students' response towards the first statement, how would you rate the teacher's knowledge of the subject matter and second statement how would you describe the teacher's overall teaching style in terms of teaching style and clarity it may be concluded that on an average 70 respondents are stating that teacher's knowledge of the subject matter and teacher's overall teaching style is excellent.

Teaching Style and Clarity: Q.3. Were the concepts explained clearly and in a manner that was easy to understand?

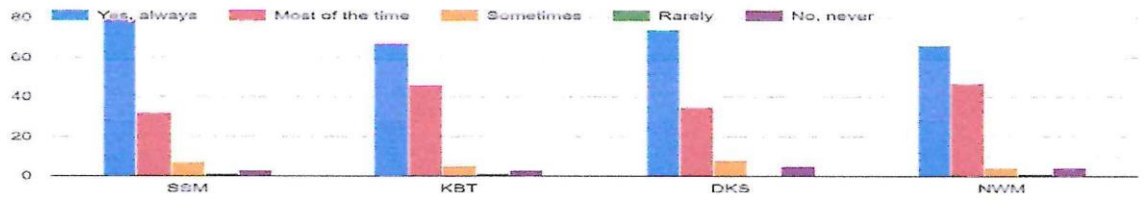


Engagement and Interaction: Q.4. Did the teacher encourage student participation and engagement in class?

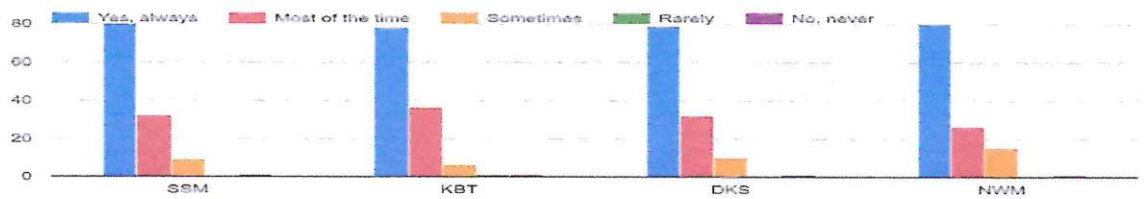


Based on the above graph regarding students' response towards the third statement, were the concepts explained clearly and in a manner that was easy to understand in terms of teaching style and clarity and fourth statement did the teacher encourage student participation and engagement in class, in terms of engagement and interaction, it may be concluded that on an average 70 respondents are stating that teacher's explained clearly and in a manner that was easy to understand them and teacher's encourage student participation and engagement in class is excellent.

Engagement and Interaction: Q.5. Were there opportunities for discussion, questions, and debates?

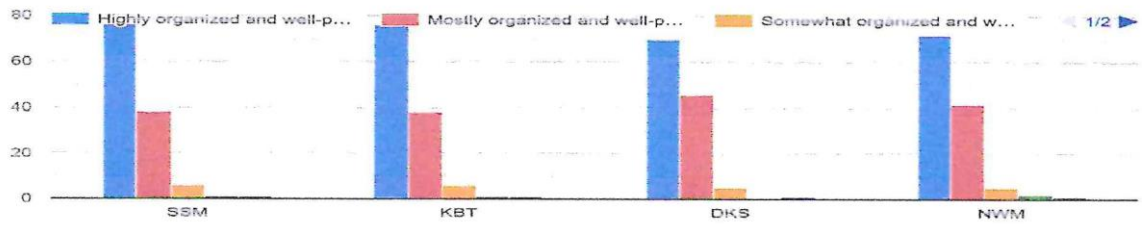


Engagement and Interaction: Q.6. Did the teacher create a supportive and inclusive learning environment?

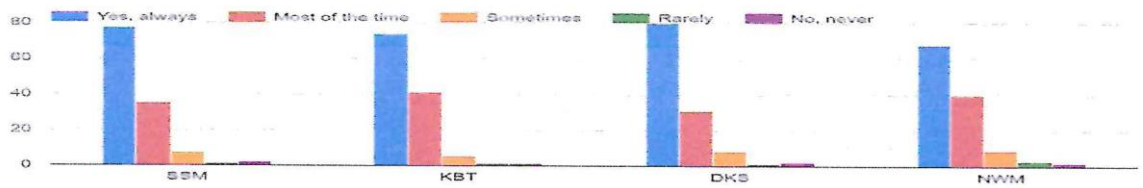


Based on the above graph regarding students' response towards the fifth statement, were there opportunities for discussion, questions, and debates in terms of engagement and interaction and sixth statement, did the teacher create a supportive and inclusive learning environment, in terms of engagement and interaction, it may be concluded that on an average 70 respondents are stating that teacher's gave them opportunities for discussion, questions, and debates in terms of engagement and interaction and teachers create a supportive and inclusive learning environment that is excellent.

Organization and Preparation: Q.7. How organized and well-prepared is the teacher for classes?

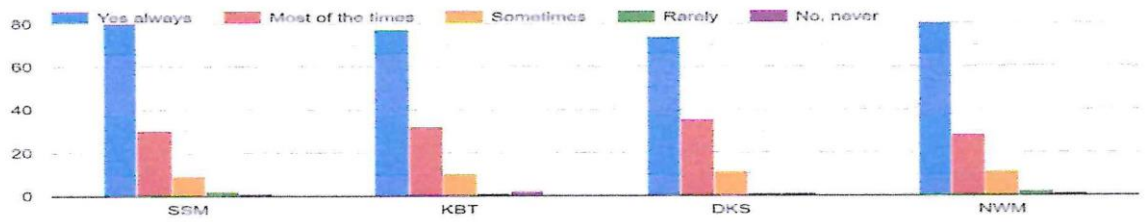


Organization and Preparation: Q.8. Were the lectures well-structured and coherent?

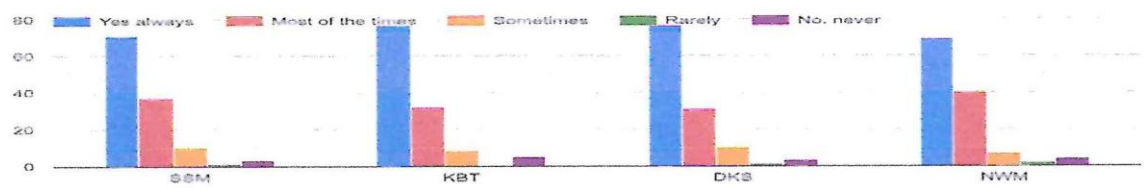


Based on the above graph regarding students' response towards the seventh statement, how organized and well-prepared is the teacher for classes and eighth statement were the lectures well-structured and coherent, in terms of organization and preparation, it may be concluded that on an average 71 respondents are stating that teachers are organized and well-prepared for classes and lectures were well-structured and coherent, in terms of organization and preparation that is excellent.

Organization and Preparation: Q.9. Did they provide relevant learning resources and materials?

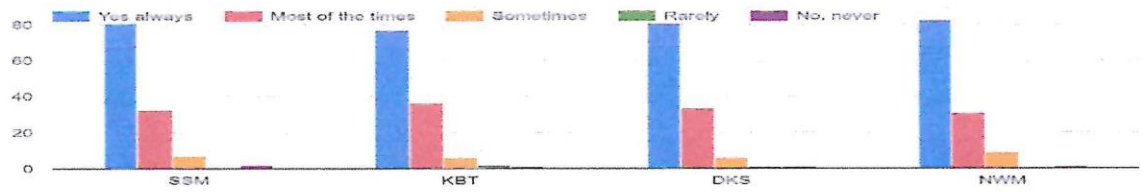


Availability and Support: Q.10. Was the teacher accessible outside of class for questions or assistance?

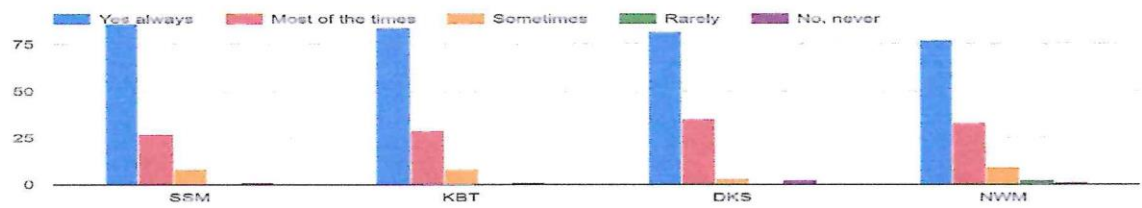


Based on the above graph regarding students' response towards the ninth statement, did they provide relevant learning resources and materials in terms of organization and preparation and tenth statement was the teacher accessible outside of class for questions or assistance, in terms of availability and support, it may be concluded that on an average 72 respondents are stating that teachers provide relevant learning resources and materials in terms of organization and preparation and teacher accessible outside of class for questions or assistance, in terms of availability and support is excellent.

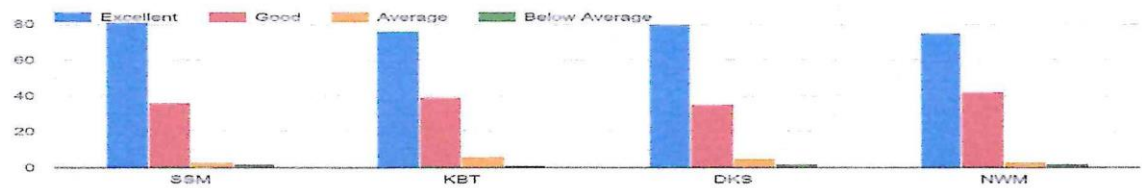
Availability and Support: Q.11.Did they provide helpful feedback on assignments and exams?



Availability and Support: Q.12.Did they respond to your inquiries in a timely manner?



Overall Experience: Q.13. Rate the overall performance of the teachers



Based on the above graph regarding students' response towards the eleventh statement, did they provide helpful feedback on assignments and exams and twelfth, did they respond to your inquiries in a timely manner, in terms of availability and support, and also thirteenth statement on an average rating the overall performance of the teachers it may be concluded that on an average 72 respondents are stating that teachers provide helpful feedback on assignments and exams and teacher respond to their inquiries in a timely manner, in terms of availability and support is excellent, while 78 respondents are stating that overall performance of the teachers is excellent.

FEEDBACK ANALYSIS OF CHEMISTRY DEPARTMENT 2022-2023

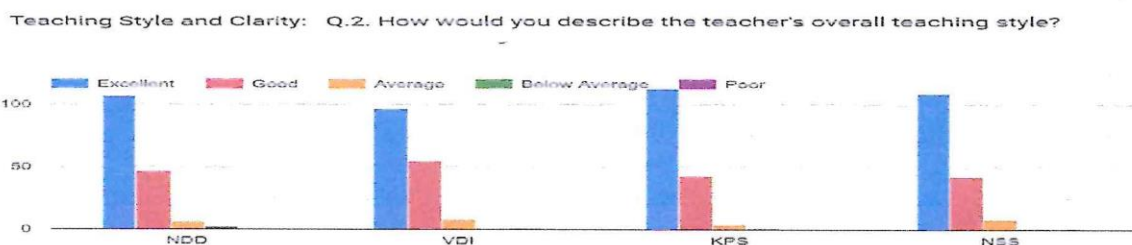
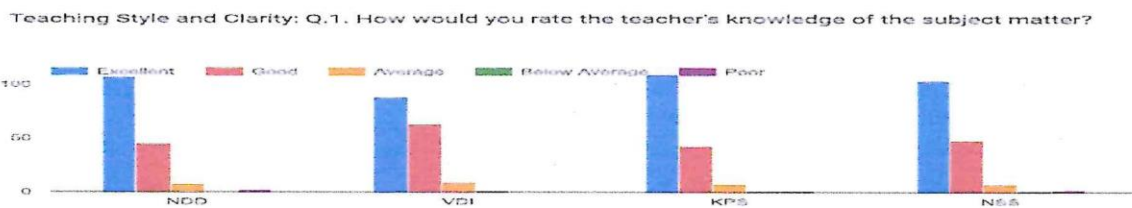
Abbreviation of teachers to be used while submitting feedback

DR. NITYANAND D DHAKE: NDD

DR. VIJYANAND D INGALE: VDI

MR. KIRAN P SABLE: KPS

MR. NILESH S. SHELKE: NSS



Based on the above graph regarding students' response towards the first statement, how would you rate the teacher's knowledge of the subject matter and second statement how would you describe the teacher's overall teaching style in terms of teaching style and clarity it may be concluded that on an average 100 respondents are stating that teacher's knowledge of the subject matter and teacher's overall teaching style is excellent.

Teaching Style and Clarity: Q.3. Were the concepts explained clearly and in a manner that was easy to understand?

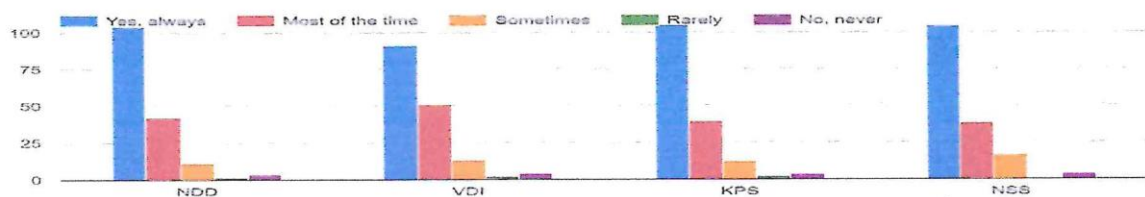


Engagement and Interaction: Q.4. Did the teacher encourage student participation and engagement in class?



Based on the above graph regarding students' response towards the third statement, were the concepts explained clearly and in a manner that was easy to understand in terms of teaching style and clarity and fourth statement did the teacher encourage student participation and engagement in class, in terms of engagement and interaction, it may be concluded that on an average 85 respondents are stating that teacher's explained clearly and in a manner that was easy to understand them and teacher's encourage student participation and engagement in class is excellent.

Engagement and Interaction: Q.5. Were there opportunities for discussion, questions, and debates?

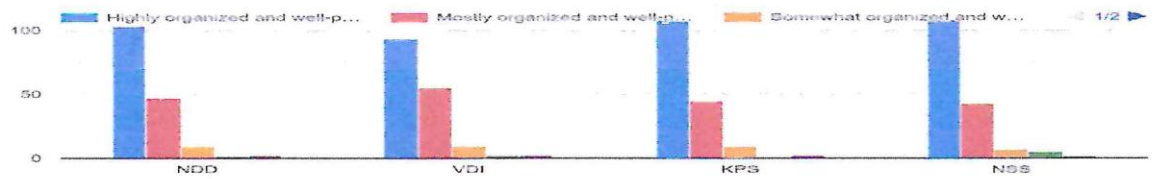


Engagement and Interaction: Q.6. Did the teacher create a supportive and inclusive learning environment?

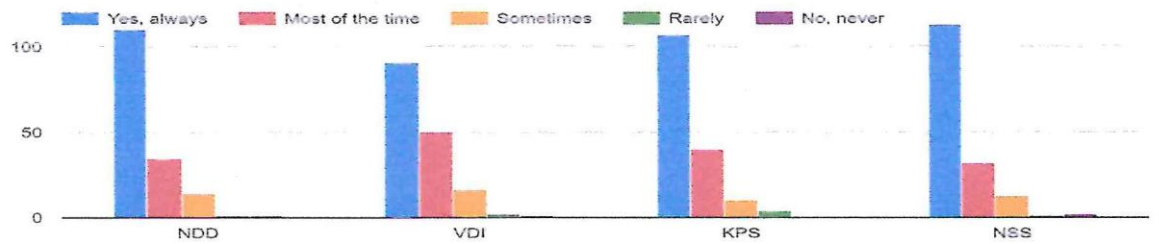


Based on the above graph regarding students' response towards the fifth statement, were there opportunities for discussion, questions, and debates in terms of engagement and interaction and sixth statement, did the teacher create a supportive and inclusive learning environment, in terms of engagement and interaction, it may be concluded that on an average 102 respondents are stating that teacher's gave them opportunities for discussion, questions, and debates in terms of engagement and interaction and teachers create a supportive and inclusive learning environment that is excellent.

Organization and Preparation: Q.7. How organized and well-prepared is the teacher for classes?

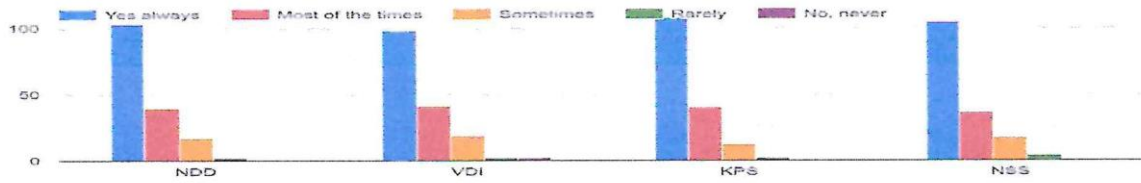


Organization and Preparation: Q.8. Were the lectures well-structured and coherent?

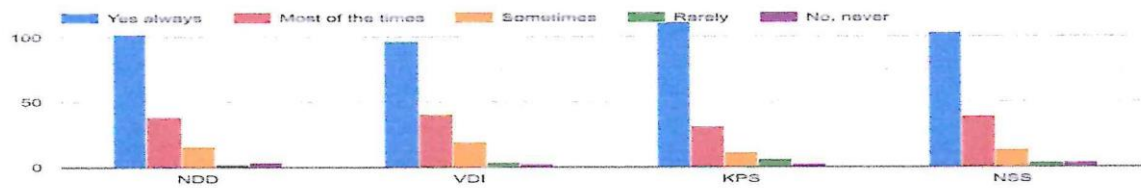


Based on the above graph regarding students' response towards the seventh statement, how organized and well-prepared is the teacher for classes and eighth statement were the lectures well-structured and coherent, in terms of organization and preparation, it may be concluded that on an average 102 respondents are stating that teachers are organized and well-prepared for classes and lectures were well-structured and coherent, in terms of organization and preparation that is excellent.

Organization and Preparation: Q.9. Did they provide relevant learning resources and materials?

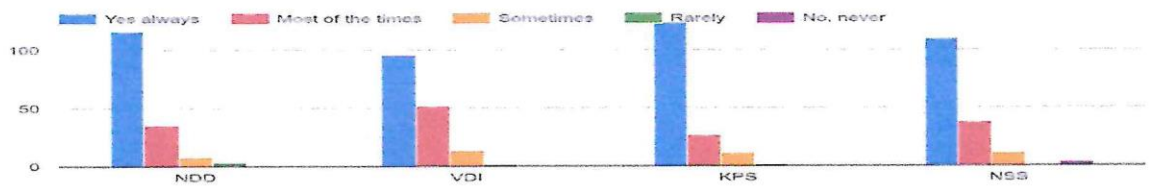


Availability and Support: Q.10. Was the teacher accessible outside of class for questions or assistance?

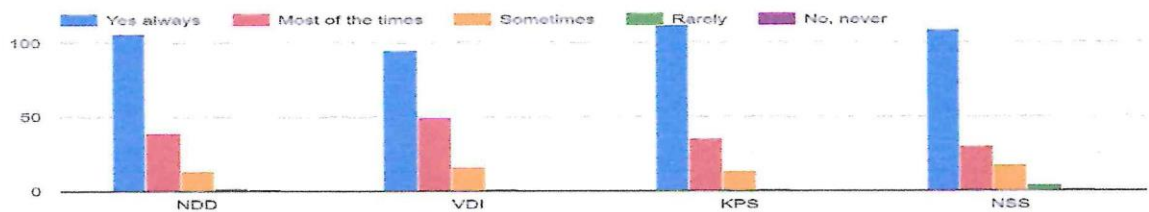


Based on the above graph regarding students' response towards the ninth statement, did they provide relevant learning resources and materials in terms of organization and preparation and tenth statement was the teacher accessible outside of class for questions or assistance, in terms of availability and support, it may be concluded that on an average 90 respondents are stating that teachers provide relevant learning resources and materials in terms of organization and preparation and teacher accessible outside of class for questions or assistance, in terms of availability and support is excellent.

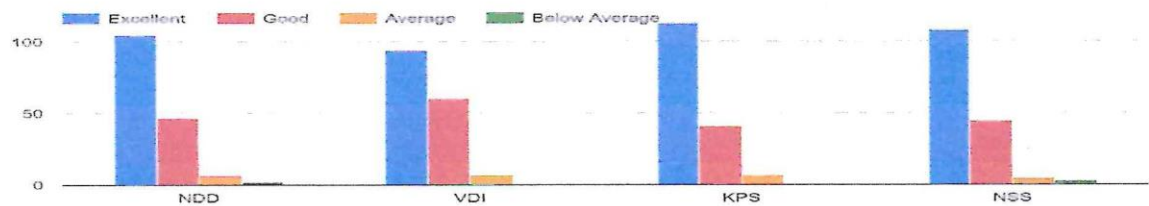
Availability and Support: Q.11.Did they provide helpful feedback on assignments and exams?



Availability and Support: Q.12.Did they respond to your inquiries in a timely manner?



Overall Experience: Q.13. Rate the overall performance of the teachers



Based on the above graph regarding students' response towards the eleventh statement, did they provide helpful feedback on assignments and exams and twelfth, did they respond to your inquiries in a timely manner, in terms of availability and support, and also thirteenth statement on an average rating the overall performance of the teachers it may be concluded that on an average 105 respondents are stating that teachers provide helpful feedback on assignments and exams and teacher respond to their inquiries in a timely manner, in terms of availability and support is excellent, while 101 respondents are stating that overall performance of the teachers is excellent.

FEEDBACK ANALYSIS OF COMMERCE DEPARTMENT 2022-2023

Abbreviation of teachers to be used while submitting feedback

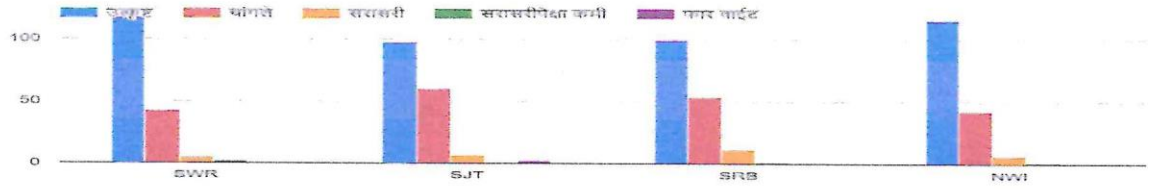
DR. SATISH W RANE: SWR

DR. SANJAY JAGDEORAO TALE: SJT

Mr. SURESH R BHATALAK: SRB

Mr. NAGESH W INGLE: NWI

शिकवण्याची शैली आणि स्पष्टता: Q.1. तुम्ही शिक्षकाच्या विषयातील ज्ञानाचे मूल्यांकन कसे कराल?

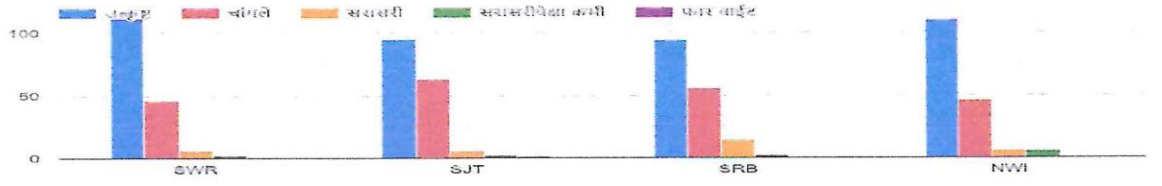


शिकवण्याची शैली आणि स्पष्टता: Q.2. शिक्षकाच्या एकूण अध्यापन शैलीचे तुम्ही कसे वर्णन कराल?

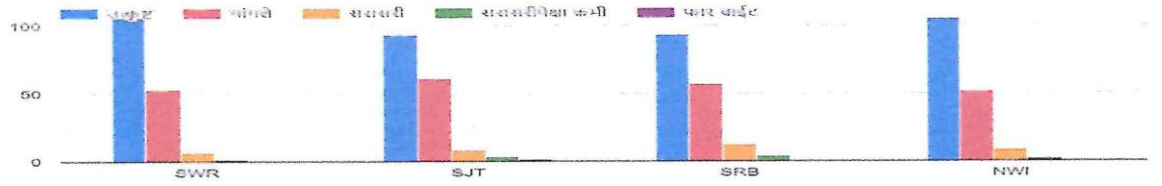


Based on the above graph regarding students' response towards the first statement, how would you rate the teacher's knowledge of the subject matter and second statement how would you describe the teacher's overall teaching style in terms of teaching style and clarity it may be concluded that on an average 95 respondents are stating that teacher's knowledge of the subject matter and 98 respondents are stating that teacher's overall teaching style is excellent.

शिकवण्याची शैली आणि स्पष्टता: Q.3. संकल्पना सोप्या आणि समजण्यास योग्य पद्धतीने स्पष्ट केल्या होत्या का?

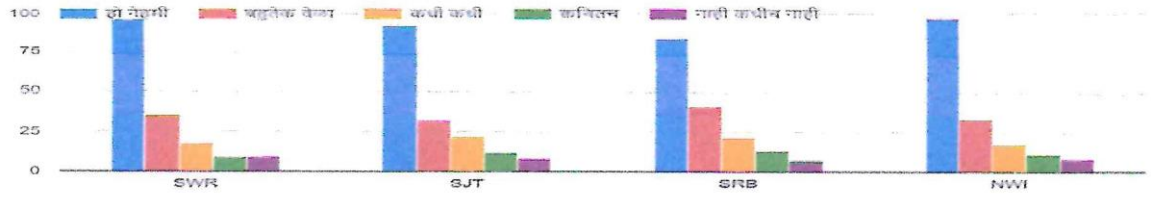


प्रतिबद्धता आणि परस्परसंवाद: Q.4. शिक्षक विद्यार्थ्यांच्या प्रतिबद्धतेला आणि वर्गात सहभागी होण्याच्या प्रवृत्तीला प्रोत्साहन देतात का ?

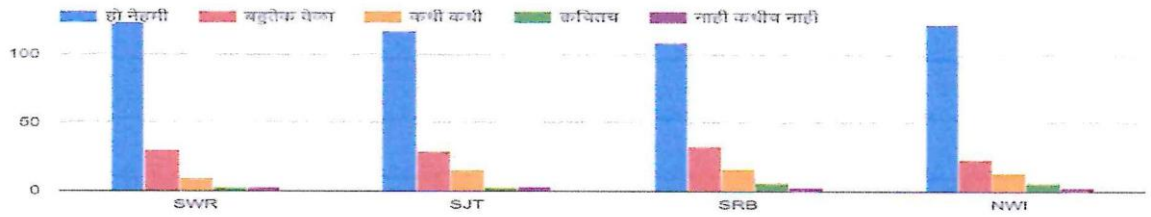


Based on the above graph regarding students' response towards the third statement, were the concepts explained clearly and in a manner that was easy to understand in terms of teaching style and clarity and fourth statement did the teacher encourage student participation and engagement in class, in terms of engagement and interaction, it may be concluded that on an average 90 respondents are stating that teacher's explained clearly and in a manner that was easy to understand them and on an average 92 respondents are stating that teacher's encourage student participation and engagement in class is excellent.

प्रतिबद्धता आणि परस्परसंवाद: Q.5. विद्यार्थ्यांना वर्गामध्ये चर्चा, प्रश्न आणि वादविवादाच्या संधी उपलब्ध होतात का?

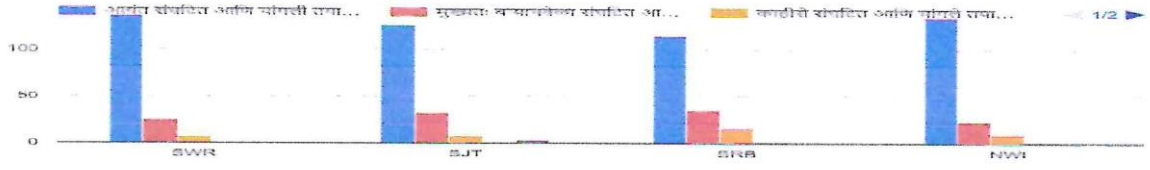


प्रतिबद्धता आणि परस्परसंवाद: प्र. ६. शिक्षकाने आश्वासक आणि सर्वसमावेशक शिक्षणाचे वातावरण निर्माण केले आहे का?

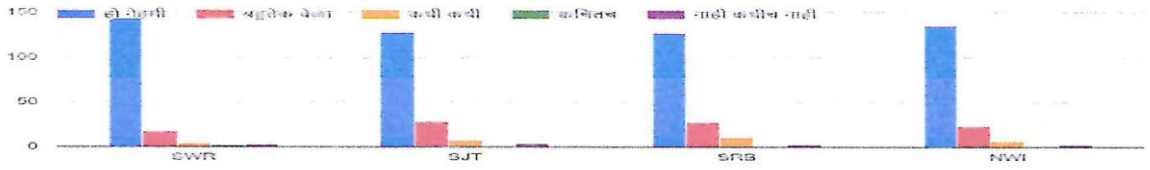


Based on the above graph regarding students' response towards the fifth statement, were there opportunities for discussion, questions, and debates in terms of engagement and interaction and sixth statement, did the teacher create a supportive and inclusive learning environment, in terms of engagement and interaction, it may be concluded that on an average 85 respondents are stating that teacher's gave them opportunities for discussion, questions, and debates in terms of engagement and interaction and 102 respondents are stating that teachers create a supportive and inclusive learning environment that is excellent.

संघटित आणि तयारी: Q.7. वर्गामध्ये शिक्षक कितपत संघटित आणि व्यवस्थित तयार आहेत?

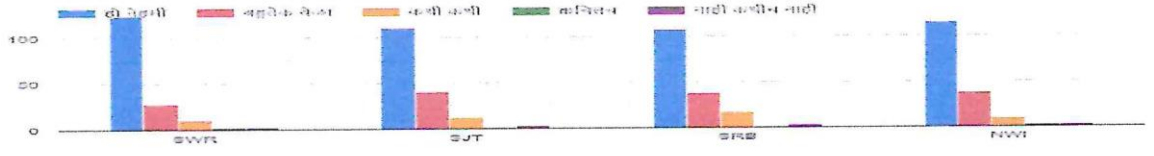


संघटित आणि तयारी: Q.8. शिक्षकांची व्याख्याने व्यवस्थित आणि सुसंगत होती का?

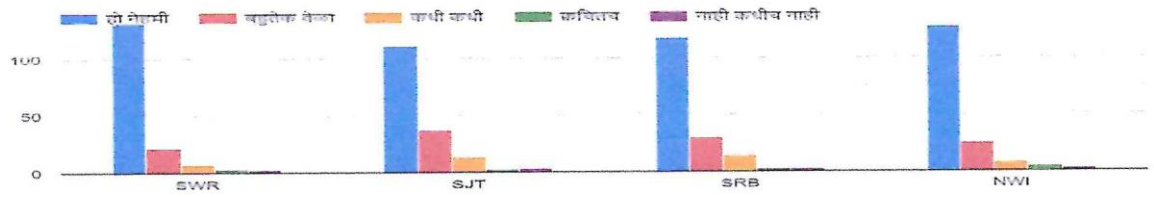


Based on the above graph regarding students' response towards the seventh statement, how organized and well-prepared is the teacher for classes and eighth statement were the lectures well-structured and coherent, in terms of organization and preparation, it may be concluded that on an average 105 respondents are stating that teachers are organized and well-prepared for classes and 110 respondents have stated that lectures were well-structured and coherent, in terms of organization and preparation that is excellent.

संघटित आणि तयारी: Q.9. शिक्षकांनी अभ्यासक्रमाची संबंधित शिक्षण सांसाधने आणि साहित्य प्रदान केले?



उपलब्धता आणि समर्थन: Q.10. शिक्षक वर्गाबाहेर विद्यार्थ्यांचे प्रश्न सोडवण्यास किंवा मदतीसाठी तयार असतात का?



Based on the above graph regarding students' response towards the ninth statement, did they provide relevant learning resources and materials in terms of organization and preparation and tenth statement was the teacher accessible outside of class for questions or assistance, in terms of availability and support, it may be concluded that on an average 102 respondents are stating that teachers provide relevant learning resources and materials in terms of organization and preparation and 105 respondents have stated that teachers are accessible outside of class for questions or assistance, in terms of availability and support is excellent.

FEEDBACK ANALYSIS OF ARTS DEPARTMENT 2022-2023

Abbreviation of teachers to be used while submitting feedback

DR. SUBHASH SHANKARRAO PAWAR: SSP

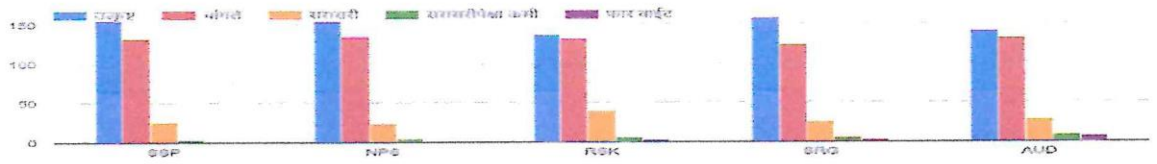
DR. NISHIGANDH P SATAV: NPS

DR. RAJENDRA SHRIRAMPANT KORDE: RSK

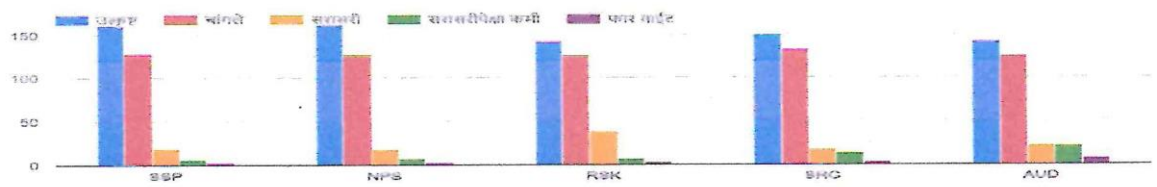
DR. SUBHASH RAMCHANDRA GURJAR: SRG

ANAND UDEBHAN DHUNDALE: AUD

शिकवण्याची शैली आणि स्पष्टता: Q.1. तुम्ही शिक्षकाच्या विषयातील ज्ञानाचे मूल्यांकन कसे कराल?

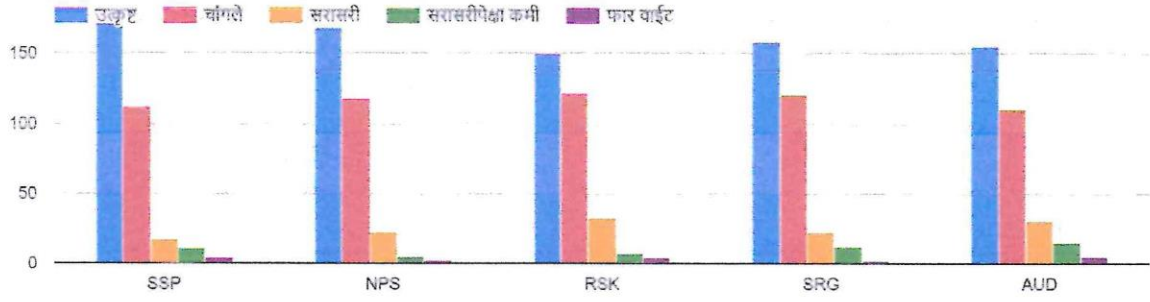


शिकवण्याची शैली आणि स्पष्टता: Q.2. शिक्षकाच्या एकूण अध्यापन शैलीचे तुम्ही कसे वर्णन कराल?

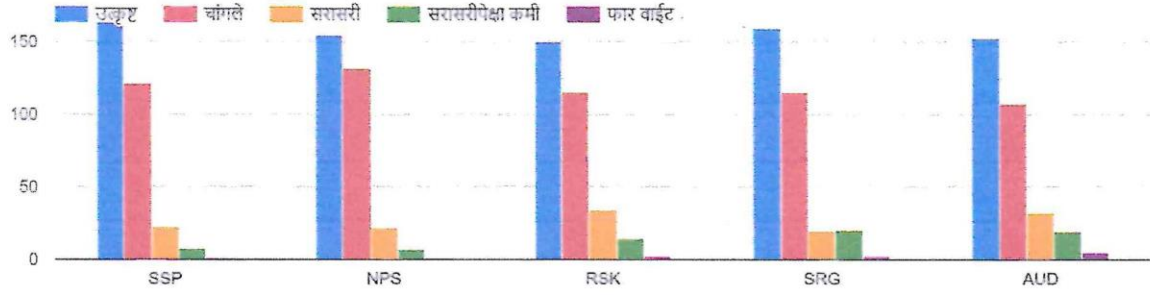


Based on the above graph regarding students' response towards the first statement, how would you rate the teacher's knowledge of the subject matter and second statement how would you describe the teacher's overall teaching style in terms of teaching style and clarity it may be concluded that on an average 150 respondents are stating that teacher's knowledge of the subject matter and 140 respondents are stating that teacher's overall teaching style is excellent.

शिकवण्याची शैली आणि स्पष्टता: Q.3. संकल्पना सोप्या आणि समजण्यास योग्य पद्धतीने स्पष्ट केल्या होत्या का?

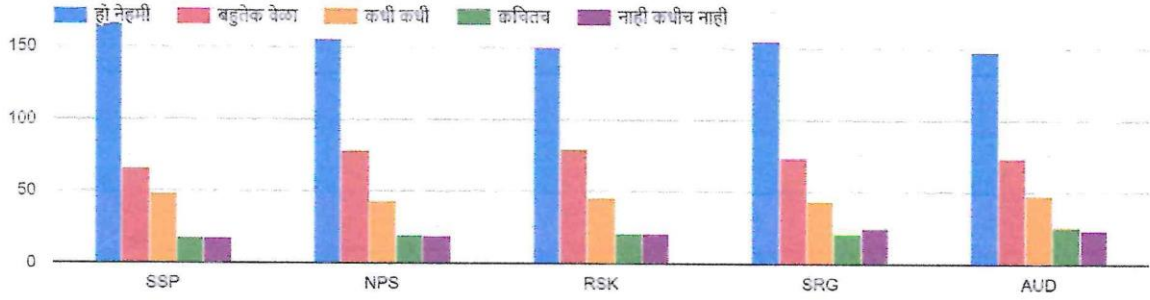


प्रतिबद्धता आणि परस्परसंवाद: Q.4. शिक्षक विद्यार्थ्यांच्या प्रतिबद्धतेला आणि वर्गात सहभागी होण्याच्या प्रवृत्तीला प्रोत्साहन देतात का ?

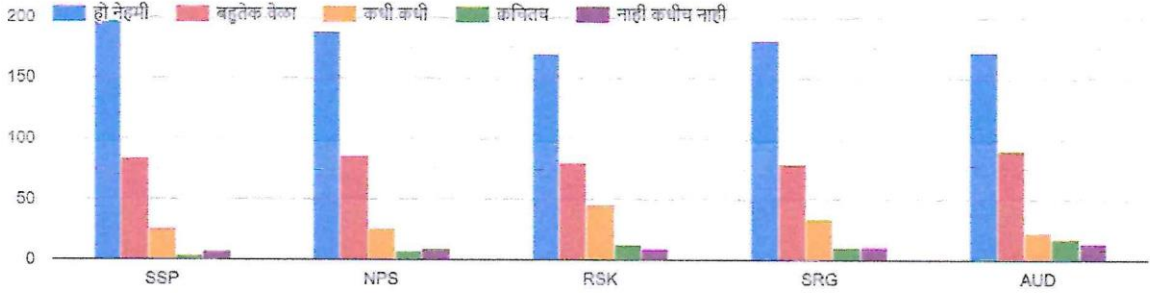


Based on the above graph regarding students' response towards the third statement, were the concepts explained clearly and in a manner that was easy to understand in terms of teaching style and clarity and fourth statement did the teacher encourage student participation and engagement in class, in terms of engagement and interaction, it may be concluded that on an average 155 respondents are stating that teacher's explained clearly and in a manner that was easy to understand them and 152 respondents have stated that teacher's encourage student participation and engagement in class is excellent.

प्रतिबद्धता आणि परस्परसंवाद: Q.5. विद्यार्थ्यांना वर्गामध्ये चर्चा, प्रश्न आणि वादविवादाच्या संधी उपलब्ध होतात का?

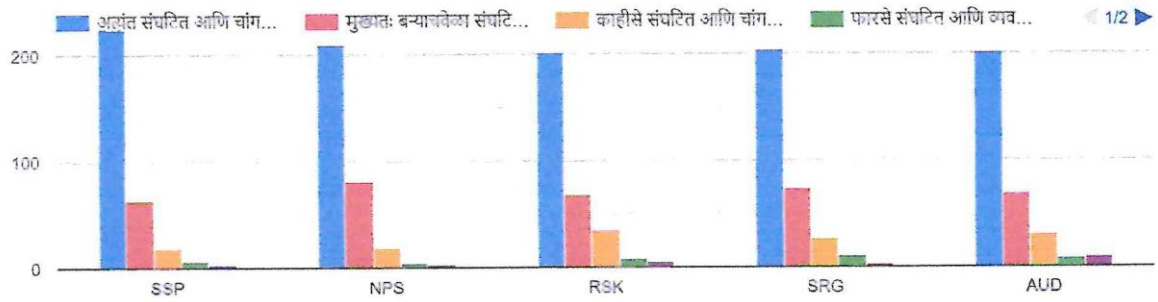


प्रतिबद्धता आणि परस्परसंवाद: प्र.६. शिक्षकाने आश्वासक आणि सर्वसमावेशक शिक्षणाचे वातावरण निर्माण केले आहे का?

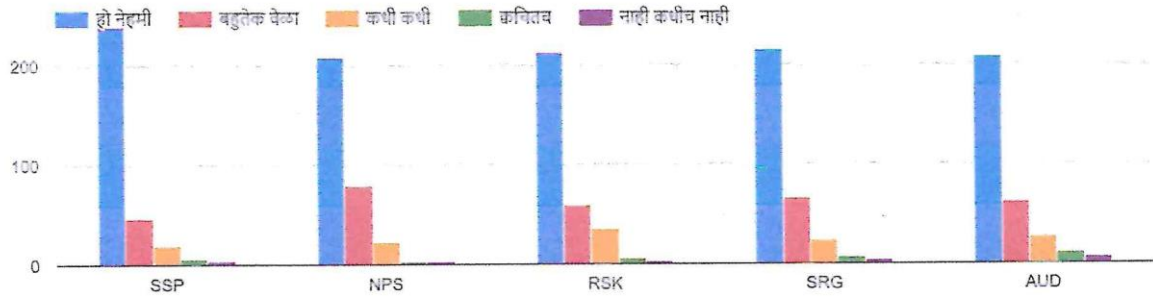


Based on the above graph regarding students' response towards the fifth statement, were there opportunities for discussion, questions, and debates in terms of engagement and interaction and sixth statement, did the teacher create a supportive and inclusive learning environment, in terms of engagement and interaction, it may be concluded that on an average 150 respondents are stating that teacher's gave them opportunities for discussion, questions, and debates in terms of engagement and interaction and 155 respondents are stating that teachers create a supportive and inclusive learning environment that is excellent.

संघटित आणि तयारी: Q.7. वर्गामध्ये शिकवणीसाठी शिक्षक कितपत संघटित आणि व्यवस्थित तयार आहेत?

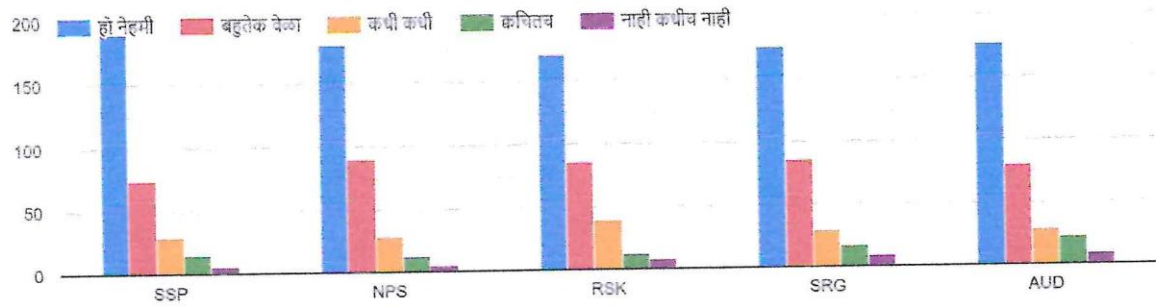


संघटित आणि तयारी: Q.8. शिक्षकांची व्याखाने व्यवस्थित आणि सुसंगत होती का?

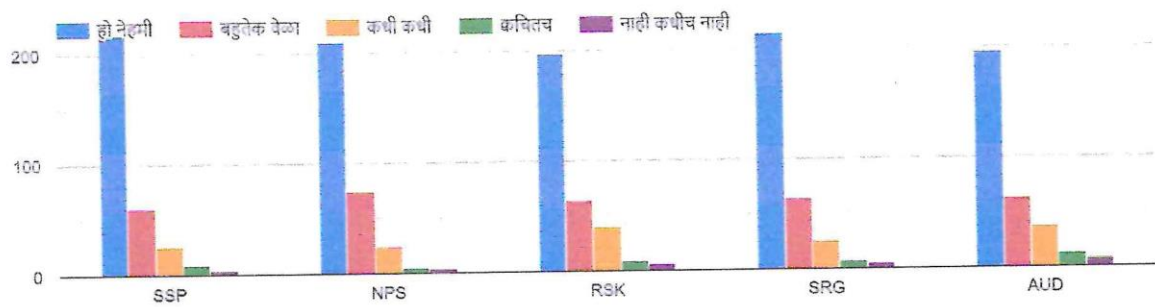


Based on the above graph regarding students' response towards the seventh statement, how organized and well-prepared is the teacher for classes and eighth statement were the lectures well-structured and coherent, in terms of organization and preparation, it may be concluded that on an average 200 respondents are stating that teachers are organized and well-prepared for classes and 205 respondents have stated that lectures were well-structured and coherent, in terms of organization and preparation that is excellent.

संगठित आणि तयारी: Q.9. शिक्षकांनी अभ्यासक्रमाशी संबंधित शिक्षण संसाधने आणि साहित्य प्रदान केले?

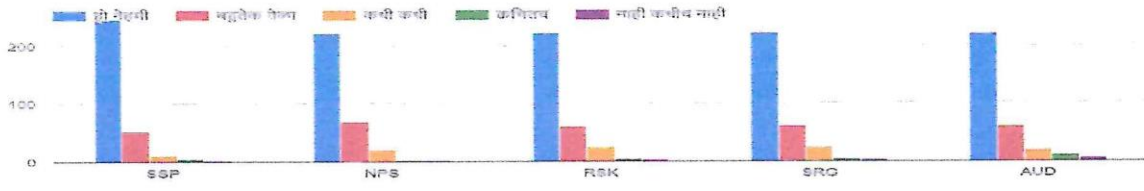


उपलब्धता आणि समर्थन: Q.10. शिक्षक वर्गाबाहेर विद्यार्थ्यांचे प्रश्न सोडवण्यास किंवा मदतीसाठी तयार असतात का?

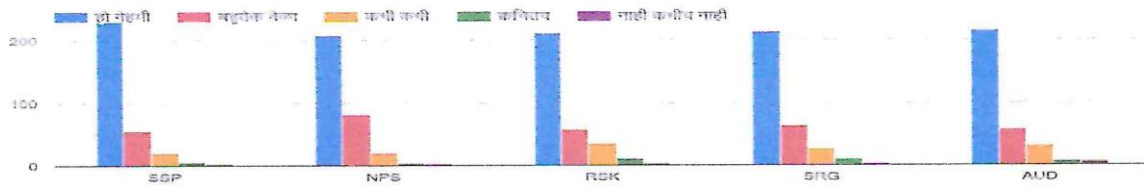


Based on the above graph regarding students' response towards the ninth statement, did they provide relevant learning resources and materials in terms of organization and preparation and tenth statement was the teacher accessible outside of class for questions or assistance, in terms of availability and support, it may be concluded that on an average 160 respondents are stating that teachers provide relevant learning resources and materials in terms of organization and preparation and 195 respondents have stated that teachers are accessible outside of class for questions or assistance, in terms of availability and support is excellent.

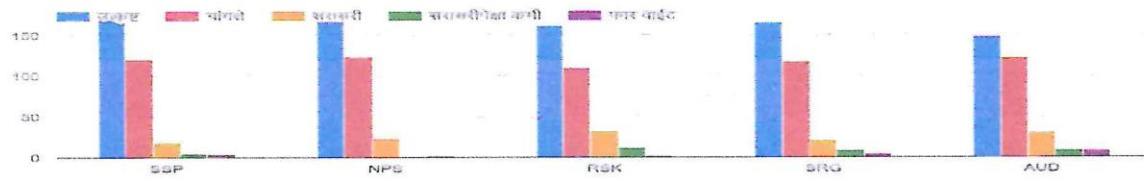
उपलब्धता आणि समर्थन: Q.11. शिक्षकांनी परीक्षेसाठी नेमून दिलेली कामगिरी म्हणजे असाइनमेंट आणि तुम्ही दिलेल्या परीक्षांवर उपयुक्त अभिप्राय दिला का?



उपलब्धता आणि समर्थन: Q.12. शिक्षकांनी तुम्ही अभ्यासक्रमाच्या रूटीने केलेल्या चौकशीला वेळेवर प्रतिसाद दिला का?



एकूण अनुभव: प्र.१३. शिक्षकांच्या एकूण कामगिरीचे मूल्यांकन करा



Based on the above graph regarding students' response towards the eleventh statement, did they provide helpful feedback on assignments and exams and twelfth, did they respond to your inquiries in a timely manner, in terms of availability and support, and also thirteenth statement on an average rating the overall performance of the teachers it may be concluded that on an average 210 respondents are stating that teachers provide helpful feedback on assignments and exams and teacher respond to their inquiries in a timely manner, in terms of availability and support is excellent, while 170 respondents are stating that overall performance of the teachers is excellent, while 100 of them have stated that their teachers performance is good.

REPORT OF THE FEEDBACK COMMITTEE FOR THE ACADEMIC YEAR 2022-2023

Feedback report from the students was collected online about the teaching learning and evaluation.

- ❖ Feedbacks collected from the students were analyzed and approval of the same was taken from the principal and then forwarded to the HOD's of the college.
- ❖ Feedbacks of students from botany, chemistry and zoology departmental students were respectively collected.
- ❖ The students were asked to point out their feedback, perception on five-point likert scale of the degree of strongly agreeing, agreeing, neutral, disagreeing, and strongly disagreeing where 5 point was given to strongly agreeing, 4 to agreeing, 3 to neutral, 2 to disagreeing, and 1 to strongly disagreeing. After that, the recorded perceptions on the different statements were processed to obtain the students feedback analysis report. An overall finding of the report faculty-wise is as follows.

1. Analysis of the Zoology Students Feedback Survey:

Based on the data collected from the students regarding teaching learning and evaluation, it may be concluded that approximately on an average 60 % and 17% of respondents are stating that teacher's knowledge of the subject matter, teacher's overall teaching style, teachers explained clearly and in a manner that is easy to understand them, teacher encourage them to participate and engaged in classroom, and also provide opportunities for discussion, questions, and debates in classroom, teacher create a supportive and inclusive learning environment, teachers are organized and well-prepared for teaching in classes, lectures are well-structured and coherent, they provide relevant learning resources and materials, teacher are accessible outside of class for questions or assistance to the students, they provide helpful feedback on assignments and exams, they respond to their inquiries in a timely manner, and overall performance of the teachers is excellent and good respectively.

2. Analysis of the Chemistry Students Feedback Survey:

Based on the data collected from the students of chemistry department regarding teaching learning and evaluation, it may be concluded that approximately on an average 64 % and 17% of respondents are stating that teacher's knowledge of the subject matter, teacher's overall teaching style, teachers explained clearly and in a manner that is easy to understand them, teacher encourage them to participate and engaged in classroom, and also provide

opportunities for discussion, questions, and debates in classroom, teacher create a supportive and inclusive learning environment, teachers are organized and well-prepared for teaching in classes, lectures are well-structured and coherent, they provide relevant learning resources and materials, teacher are accessible outside of class for questions or assistance to the students, they provide helpful feedback on assignments and exams, they respond to their inquiries in a timely manner, and overall performance of the teachers is excellent and good respectively.

3. Analysis of the Botany Students Feedback Survey:

Based on the data collected from botany department students regarding teaching learning and evaluation, it may be concluded that approximately on an average 61 % and 18% of respondents are stating that teacher's knowledge of the subject matter, teacher's overall teaching style, teachers explained clearly and in a manner that is easy to understand them, teacher encourage them to participate and engaged in classroom, and also provide opportunities for discussion, questions, and debates in classroom, teacher create a supportive and inclusive learning environment, teachers are organized and well-prepared for teaching in classes, lectures are well-structured and coherent, they provide relevant learning resources and materials, teacher are accessible outside of class for questions or assistance to the students, they provide helpful feedback on assignments and exams, they respond to their inquiries in a timely manner, and overall performance of the teachers is excellent and good respectively.

4. Analysis of the Commerce Students Feedback Survey:

Based on the data collected from the commerce students regarding teaching learning and evaluation, it may be concluded that approximately on an average 62 % and 12% of respondents are stating that teacher's knowledge of the subject matter, teacher's overall teaching style, teachers explained clearly and in a manner that is easy to understand them, teacher encourage them to participate and engaged in classroom, and also provide opportunities for discussion, questions, and debates in classroom, teacher create a supportive and inclusive learning environment, teachers are organized and well-prepared for teaching in classes, lectures are well-structured and coherent, they provide relevant learning resources and materials, teacher are accessible outside of class for questions or assistance to the students, they provide helpful feedback on assignments and exams, they respond to their inquiries in a timely manner, and overall performance of the teachers is excellent and good respectively.

5. Analysis of the Arts Students Feedback Survey:

Based on the data collected from the arts faculty students regarding teaching learning and evaluation, it may be concluded that approximately on an average 60 % and 17% of respondents are stating that teacher's knowledge of the subject matter, teacher's overall teaching style, teachers explained clearly and in a manner that is easy to understand them, teacher encourage them to participate and engaged in classroom, and also provide opportunities for discussion, questions, and debates in classroom, teacher create a supportive and inclusive learning environment, teachers are organized and well-prepared for teaching in classes, lectures are well-structured and coherent, they provide relevant learning resources and materials, teacher are accessible outside of class for questions or assistance to the students, they provide helpful feedback on assignments and exams, they respond to their inquiries in a timely manner, and overall performance of the teachers is excellent and good respectively.

Suggestion for the betterment were given by the committee as follows

- ❖ Hence afterwar online feedback should be collected and the same should be listed on website.
- ❖ Feedback on syllabus must be collected from here onward.
- ❖ Questionnaire should be restructured as per NAAC guidelines.
- ❖ Students should be informed in advance and motivated to fill online feedback form.
- ❖ Increase involvement of students in making presentation on syllabus.
- ❖ Practical knowledge such as field visit, industrial trip should be increased.


Signature

Dr. Sanjay J. Tale
Feedback Committee (Convener)



Signature


Dr. S.S. PAWAR
Principal

Members


- i) Mr. Sunil Makode
- ii) Dr. Dnyaneshwar Sherkar
- iii) Dr. Rajendra Korde
- iv) Mr. Nilesh Shelke

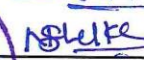
Signature












Principal
Arts & Commerce College
Warvat Bakal Dist. Buldana

Questionnaire Format

Following are links of the sample form of an online google form was sent to the students, to obtained their responses on teaching, learning, evaluation and syllabus completion.

For Arts students this link was sent: <https://forms.gle/haKR1wMJdtkME1Sq8>

For Commerce students this link was sent: <https://forms.gle/iuiW9jNgg88sYRC19>

For the Zoology students this link was sent: <https://forms.gle/Rt7WfYpmio49VBJa9>

For the Botany students this link was sent: <https://forms.gle/nLdkaECzdBk5MbiS8>

For the Chemistry students this link was sent: <https://forms.gle/HZ2VJSv1GHoM5Xve8>




Principal
Arts & Commerce College
Warvat Bakal Dist Buldhana

Green Audit

**Report
On
Green Audit
At
Arts & Commerce College warwat Bakal, Buldana.
(Year 2022-23)**

Prepared by

Nutan Urja Solutions

A 703, Balaji Witefield, Near Sunni's World,

Sus Road, Sus, Pune 411 021

Phone: 83568 18381. Email: nutanurja.solutions@gmail.com

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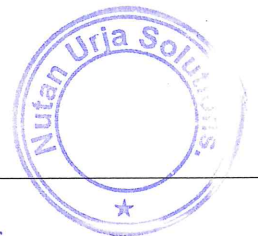


Acknowledgement

We at Nutan Urja Solutions, Pune, express our sincere gratitude to the management of Arts & Commerce College warwat Bakal, Buldana for awarding us the assignment of Green Audit of their college premises.

We are also thankful to various Head of Departments & other Staff members for helping us during the field measurements.

We hope that the recommendations stated in this report will be useful and worthy of discussions to take things forward to help implementation of energy conservation measures and green practices. While we have made every attempt to adhere to high quality standards, in both data collection and analysis through the report, we would welcome your suggestions so as to improve upon this report further.



Executive Summary

Green Audit of Arts & Commerce College warwat Bakal, Buldana is conducted by Nutan Urja Solutions, Pune. Based On the audit field study, following important points can be presented.

1. Present Energy Consumption

Arts & Commerce College warwat Bakal, Buldana uses Electrical Energy as the source of Energy for various equipment in the college campus. In the following Table, we present the details of Energy Consumption.

Table no 1: Details of energy consumption

Sr no	Parameter	Energy consumed, (Units)	CO2 Emission (MT)
1	Maximum	427	0.34
2	Minimum	-	-
3	Average	162	0.13
4	Total	1,940	1.55

2. Various Measures Adopted for Energy Conservation

1. Usage of STAR Rated ACs at new installations
2. Usage of LED lights at some indoor locations
3. Usage of LED Lights for outdoor lighting.

3. Usage of Renewable Energy

The collage has installed 12 kW Solar PV Power Plant.

4. Rain Water Harvesting

The College has installed the Rainwater harvesting project, to reduce dependency on municipal corporation water supply.

5. Waste Management

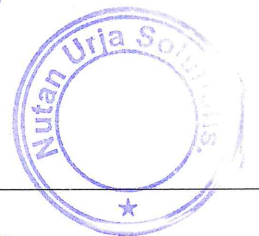
The College has already installed a Bio composting Plant, wherein, the bio-degradable waste is composted & is used as fertilizer for the garden.

The internal communication is through emails and hence there is hardly any generation of e-Waste in the premises.



6. Notes and Assumptions

1. Daily working hours-10 Nos
2. Annual working Days-250 Nos
3. Average Rate of Electrical Energy : Rs 11/- per kWh



Abbreviations

CFL	:	Compact Fluorescent Lamp
FTL	:	Fluorescent Tube Light
LED	:	Light Emitting Diode
V	:	Voltage
I	:	Current
kW	:	Kilo- Watt
kWh	:	kilo-Watt Hour
kVA	:	Active Power



1. Introduction

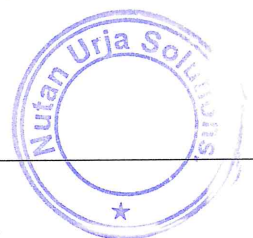
The mission undertaken by Arts & Commerce College warwat Bakal, Buldana is to strive and provide Education to those poor, downtrodden and exploited communities of the area. It will accelerate the development of this region and establish confidence among the youth.

1.1 Objectives

1. To study present level of Energy Consumption
2. To Study the present CO₂ emissions
3. To assess the various equipment/facilities from Energy efficiency aspect
4. To measure various Electrical parameters
5. To study Scope for usage of Renewable Energy
6. To study various measures to reduce the Energy Consumption

1.2 Audit methodology

1. Study of connected load
2. Study of various Electrical parameters
3. To prepare the Report with various Encon measures with payback analysis



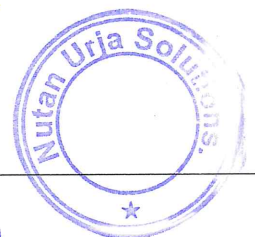
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In this chapter, electricity bills are studied for the analysis of electrical energy consumption.

Table no 2.1: Summary of electricity bills

No	Month	Energy (kWh)	Bill Amount (Rs)
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3	Apr-23	169	1,850
4	Mar-23	139	1,428
5	Feb-23	99	963
6	Jan-23	103	1,050
7	Dec-22	110	1,140
8	Nov-22	101	1,010
9	Oct-22	427	4,184
10	Sep-22	236	2,186
11	Aug-22	212	2,100
12	Jul-22	196	1,920
	Total	1,940	20,051

Variation in energy consumption is as follows,



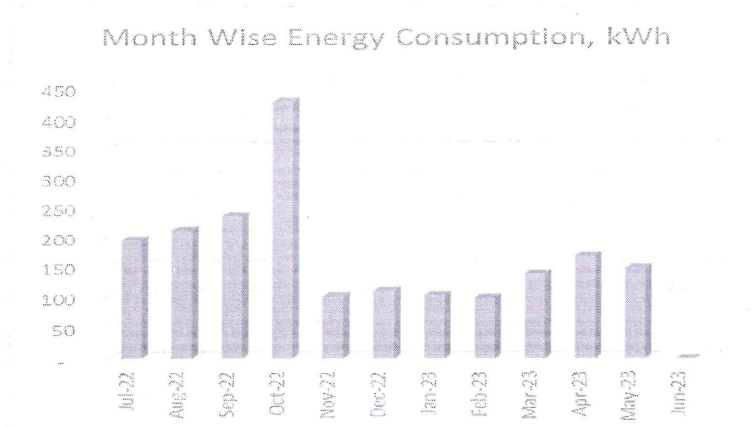


Figure 2.1: Month wise energy consumption

Monthly variation in electricity bill is as follows,

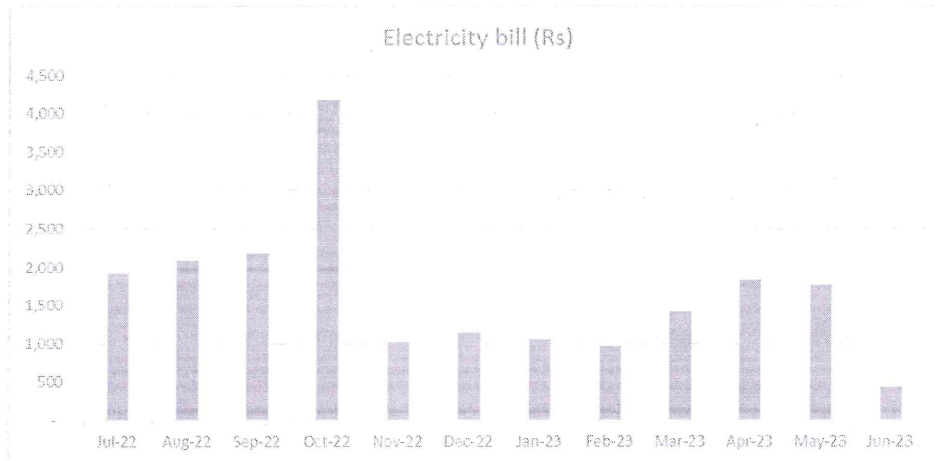


Figure 2.2: Month wise electricity bill

Key observations of electricity bill are as follows,

Table no 2.2: Key observations

Sr no	Parameter	Energy consumed, (Units)	CO2 Emission (MT)
1	Maximum	427	0.34
2	Minimum	-	-
3	Average	162	0.13
4	Total	1,940	1.55



3. Carbon Foot printing

1. A **Carbon Foot print** is defined as the Total Greenhouse Gas emissions (CO₂ emissions), emitted due to various activities. In this we compute the emissions of Carbon-Di-Oxide, by usage of the various form of Electrical Energy used by the College for performing its day to day activities

2. Basis for computation of CO₂ Emissions:

The basis of Calculation for CO₂ emissions due to Electrical Energy is as under

- 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO₂** into atmosphere.

Based on the above Data we compute the CO₂ emissions which are being released in to the atmosphere by the College due to its Day to Day operations

We herewith furnish the details of various forms of Energy consumption as under

Table 3.1: Month wise Consumption of Electrical Energy & CO₂ Emissions

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Jun-23	-	0.00
2	May-23	148	0.12
3	Apr-23	169	0.14
4	Mar-23	139	0.11
5	Feb-23	99	0.08
6	Jan-23	103	0.08
7	Dec-22	110	0.09
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9	Oct-22	427	0.34
10	Sep-22	236	0.19
11	Aug-22	212	0.17
12	Jul-22	196	0.16
	Total	1,940	1.55

In the following Chart we present the CO₂ emissions due to usage of Electrical Energy.



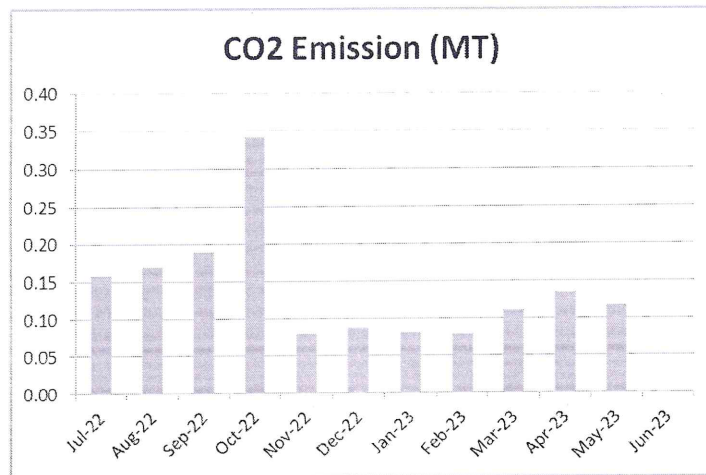
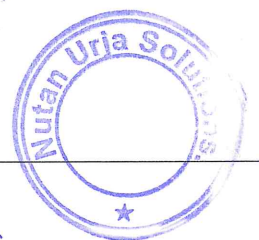


Figure 3.1: Month wise CO2 Emission



4. Study of Usage of Alternate Energy

In this Chapter, we compute the percentage of Usage of Alternate/Renewable Energy to Annual Energy Requirement of the College. The College has installed Roof Top Solar PV System. The Installed Capacity of Solar PV Plant is **10 kWp**.

Table 4.1: Computation of % Usage of Alternate Energy to Annual Energy Requirement

No	Particulars	Value	Unit
1	Annual Energy Purchased from MSEDCL	1,940	kWh/Annum
2	Energy Generated by Roof Top Solar PV System	18,000	kWh/Annum
3	Total Energy Requirement of College	19,940	kWh/Annum
4	% of Usage of Alternate Energy to Annual Energy Requirement	90	%

Photograph of Solar PV plant



5. Study of Rain Water Harvesting

The College has already installed Rain Water Harvesting project, wherein the rain water falling on the terrace is collected and through pipes it is fed to underground Water Storage tank. This stored water is then reused for domestic purpose.

Photograph of Rain Water Harvesting



6. Study of Waste Management

6.1 Solid Waste Management

The College has already installed a Bio composting Plant, wherein, the bio-degradable waste is composted & is used as fertilizer for the garden.

Photographs of Bio Composting Storage Tanks:



6.2 e-Waste Management

The internal communication is through emails and hence there is hardly any generation of e-Waste in the premises.

7. Study of Green Practices

7.1 No of students who don't use own Vehicle for coming to Institute

Out of total students coming to Institute, about 60% students use own Automobile.

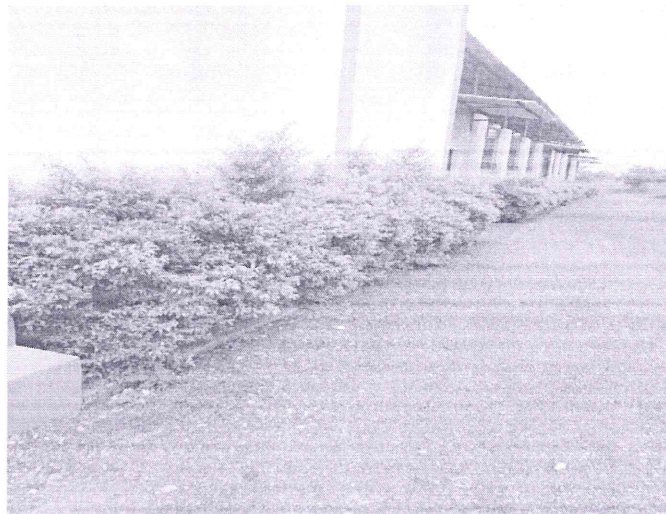
7.2 Usage of Public Transport

During the Students transport study, it was revealed that the local students who are residing near areas make use of Public Transport like Municipal Transport local buses, local sharing type auto rickshaws. Some students use bicycles.

7.3 Pedestrian Friendly Roads

The Institute has well defined pedestrian foot paths as to facilitate the easy movement of the students within the campus.

Photograph of Road within campus



7.4 Plastic Free Campus

The Institute is an active participant in the Government of India's most prestigious project of SWATCHH BHART ABHIYAN. The Institute has displayed boards in the Campus, to make the campus plastic free. Various measures adopted for this purpose are as follows

- Installation of Separate waste bins for Dry waste & wet waste
- Usage of paper tea cups in the Institute canteen
- Display of boards in the campus for Plastic Free campus

7.5 Paperless Office

The internal communication of the Institute is through the Internet. There are hardly any day to day operations, where printing is required.

7.6 Green Landscaping with Trees and Plants

The Institute has beautiful maintained Garden.



Figure 7.1: Beautiful maintained Garden of college

Nutan Urja Solutions

A 703, Balaji Witefield, Near Sunni's World,

Sus Road, Sus, Pune 411 021

Phone: 83568 18381. Email: nutanurja.solutions@gmail.com

Date: 21/07/2023

CERTIFICATE

This is to certify that we have conducted Green Audit at Arts & Commerce College Warwat Bakal, Buldana for the year 2022–23.

The College has already adopted **Green** practices like:

- Installation of Rain Water Harvesting system
- Installation of Bio composting pit
- Usage of Energy Efficient LED
- Usage of Energy Efficient BEE STAR Rated equipment
- College has installed 12kW Solar PV system

We appreciate the support of Management, involvement of faculty members and students in the process of making the campus Green.

Nutan Urja Solutions,



K G Bhatwadekar,

Certified Energy Auditor,

EA - 22428

Report

On

Energy Audit

At

Arts & Commerce College warwat Bakal, Buldana.

(Year 2022-23)

Energy Audit

Prepared by

Nutan Urja Solutions

A 703, Balaji Witefield, Near Sunni's World,

Sus Road, Sus, Pune 411 021

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1.2 Audit Methodology:	6
1.3 General Details of College	6
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Acknowledgement

We at Nutan Urja Solutions, Pune, express our sincere gratitude to the management of Arts & Commerce College Warwat Bakal, Buldana for awarding us the assignment of Energy Audit of their college premises.

We are also thankful to various Head of Departments & other Staff members for helping us during the field measurements.

We hope that the recommendations stated in this report will be useful and worthy of discussions to take things forward to help implementation of energy conservation measures through energy savings. While we have made every attempt to adhere to high quality standards, in both data collection and analysis through the report, we would welcome your suggestions so as to improve upon this report further.



Executive Summary

After the Field measurements & analysis, we present herewith important observations made and various measures to reduce the Energy Consumption & mitigate the CO₂ emissions. College consumes Energy in the form of Electrical Energy used for various gadgets, Office & other facilities.

1. Present Energy Consumption

In the following Table, we present the details of Energy Consumption.

Table no 2.1: Details of energy consumption

Sr no	Parameter	Energy consumed, (Units)	CO2 Emission (MT)
1	Maximum	427	0.34
2	Minimum	-	-
3	Average	162	0.13
4	Total	1,940	1.55

2. Energy Conservation Projects already installed

1. Usage of LED lights at some indoor locations
2. Usage of LED Lights for outdoor lighting.
3. Usage of STAR rated fans at new installations

3. Key Observations

1. Usage of LED lights.
2. Usage of star rated equipment.
3. Maintained a good power factor.

5. Percentage of Usage of LED Lighting

The College has various Types of Light fittings, namely: LED & CFL. The percentage of Annual LED Lighting Usage to Annual Lighting requirement works out to be 94 %.



6. Percentage of Usage of Alternate Energy

The College has installed a Roof Top Solar PV Plant. The percentage of usage of Alternate Energy to Annual Energy Requirement is 90 %.

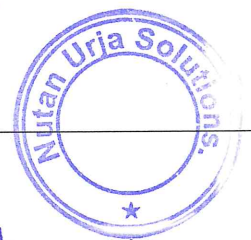
7. Recommendations

Table no 1: Recommendations for energy savings

No	Recommendation	Annual Saving potential, kWh/Annum	Annual Monetary Gain, Rs.	Investment Required, Rs.	Payback period, Months
1	Replacement of 29 Nos Old Ceiling Fans with STAR rating fans	377	4,147	63,046	182
	Total	377	4,147	63,046	182

8 Notes & Assumptions

1. Daily working hours-10 Nos
2. Annual working Days-300 Nos
3. Average Rate of Electrical Energy : Rs 11/- per kWh



Abbreviations

CFL	:	Compact Fluorescent Lamp
FTL	:	Fluorescent Tube Light
LED	:	Light Emitting Diode
V	:	Voltage
I	:	Current
kW	:	Kilo- Watt
kWh	:	kilo-Watt Hour
kVA	:	Active Power



1. Introduction

The mission undertaken by Arts & Commerce College warwat Bakal, Buldana is to strive and provide Education to those poor, downtrodden and exploited communities of the area. It will accelerate the development of this region and establish confidence among the youth.

1.1 Objectives

1. To study present level of Energy Consumption
2. To Study Electrical Consumption
3. To assess the various equipment/facilities from Energy efficiency aspect
4. To study various measures to reduce the Energy Consumption

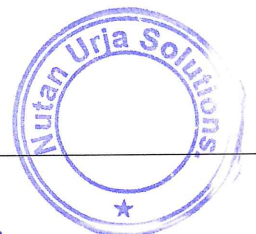
1.2 Audit Methodology:

1. Study of connected load
2. Study of various Electrical parameters
3. To prepare the Report with various Encon measures with payback analysis

1.3 General Details of College

Table No-1.1: Details of college

No	Head	Particulars
1	Name of Institution	Arts & Commerce College warwat Bakal, Buldana
2	Address	Arts & Commerce College warwat Bakal, Buldana ,Maharashtra 444202
3	Affiliation	Sant Gadge Baba Amravati University, Amravati.



2. Study of connected load

In this chapter, we present details of various connected electrical equipment and electrical load.

Table No-2.1: Location wise study of Electrical fittings in various buildings

No	Location	LED tube (20W)	CFL	Fans	Computers (65W)
1	IQAC	3		3	2
2	Exam room		1	1	
3	Seminar Hall	4		7	
4	Staff Room	2		3	
5	G1	1		1	
6	G2	1		1	
7	G3	1		1	
8	G4 (Principal room)	1	1	1	
9	G5 (Office)	3		3	4
10	G6	2		1	1
11	F1	1			1
12	F2	1			1
13	F3	1			1
14	F4	1			1
15	F5	2			1
16	S1	1			1
17	S4	1			1
18	S5	3			1
19	Reading room	1			1
20	Library	10		7	1
21	Chemistry lab	2			1
22	Chemistry Dept	1			1
23	Zoology lab	2			1
24	Zoology Dept.	2			1
25	Physics lab	2			1
26	Botany Dept.	2			1
27	Computer lab	2			6
28	Meeting hall	3			2
29	Rest House	1			2



30	NCC	1			1
31	Sports	1			1
32	NSS	1			1
33	Hall	5			5
	Total	65	2	29	41

Apart from above load, the school has pump. Individual fitting wise load is as under.

Table No 2.2: Equipment wise Connected Load

No	Equipment	Qty	Load, W/Unit	Load, kW
1	Ceiling Fan	29	65	1.9
2	LED-20W	65	20	1.3
3	CFL	2	24	0.0
4	Computers	41	65	2.7
5	Pump (2HP)			1.5
	Total			7.1

Data can be represented in terms of PIE chart as under,

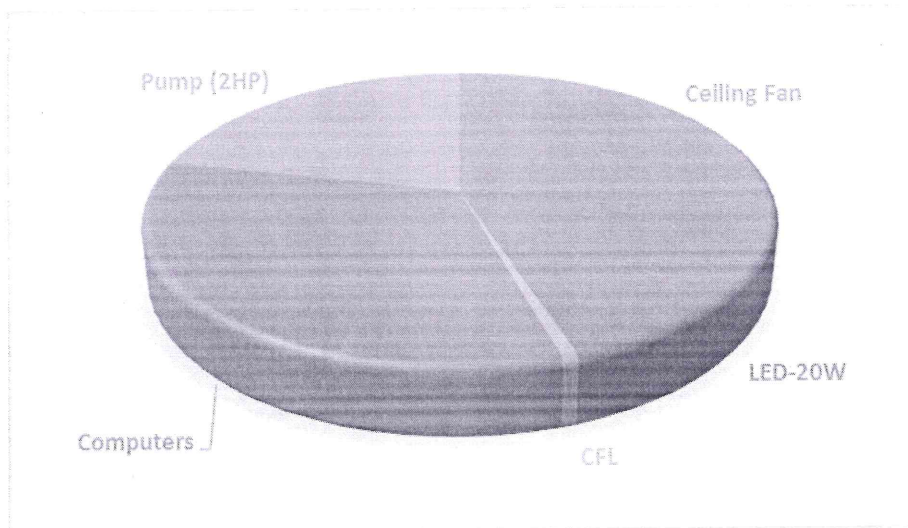


Figure 2.1: Distribution of connected load.

3. Study of Electrical Energy Consumption

In this chapter, electricity bills are studied for the analysis of electrical energy consumption.

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No	Month	Energy (kWh)	Bill Amount (Rs)
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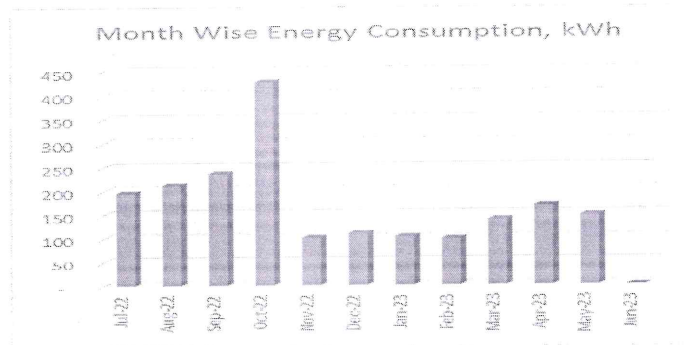


Figure 3.1: Month wise energy consumption



Monthly variation in electricity bill is as follows,

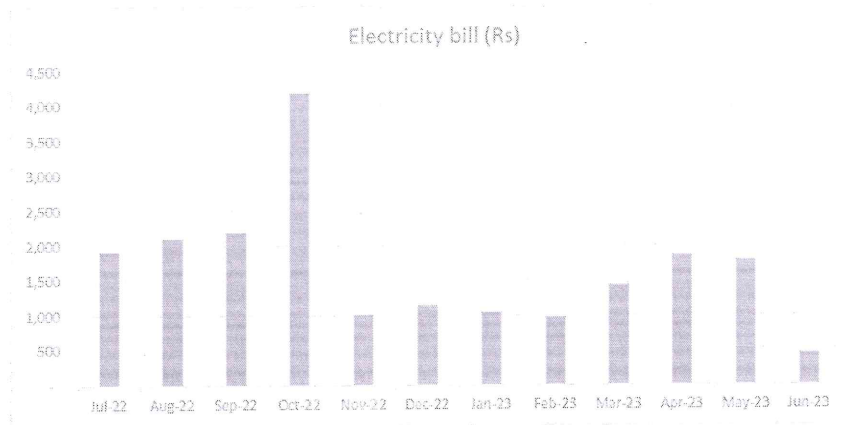


Figure 3.2: Month wise electricity bill

Key observations of electricity bill are as follows,

Table no 3.2: Key observations

Sr no	Parameter	Energy consumed, (Units)	CO2 Emission (MT)
1	Maximum	427	0.34
2	Minimum	-	-
3	Average	162	0.13
4	Total	1,940	1.55



4. Carbon Foot printing

1. A **Carbon Foot print** is defined as the Total Greenhouse Gas emissions (CO₂ emissions), emitted due to various activities. In this we compute the emissions of Carbon-Di-Oxide, by usage of the various form of Electrical Energy used by the College for performing its day to day activities

2. Basis for computation of CO₂ Emissions:

The basis of Calculation for CO₂ emissions due to Electrical Energy is as under

- 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO₂** into atmosphere.

Based on the above Data we compute the CO₂ emissions which are being released in to the atmosphere by the College due to its Day to Day operations

We herewith furnish the details of various forms of Energy consumption as under

Table 4.1: Month wise Consumption of Electrical Energy & CO₂ Emissions

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
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12	Jul-22	196	0.16
	Total	1,940	1.55



In the following Chart we present the CO2 emissions due to usage of Electrical Energy.

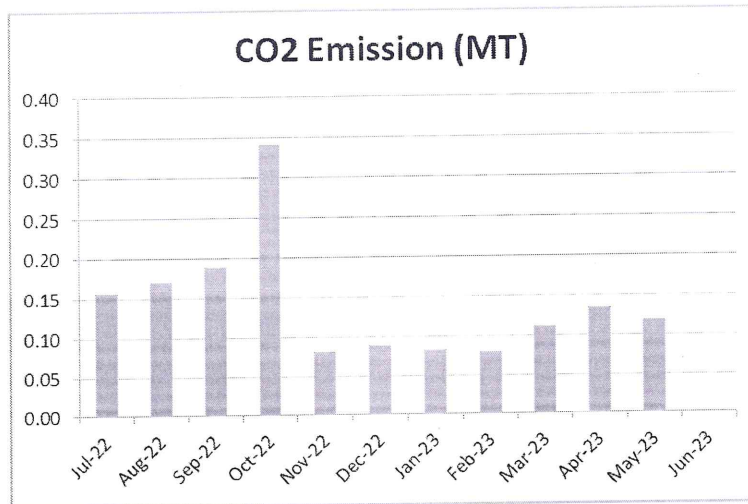


Figure 4.1: Month wise CO2 Emission



5. Study of utilities

5.1 Study of Lighting

There are 2 CFLs and 65 LEDs in indoor lightings.

5.2 Ceiling Fans

At building facility, there are about 29 Nos Old Ceiling Fans, which consumed about 65 W of Electrical Energy. It is recommended to replace these old Fans with BEE STAR Rated Ceiling Fans.

5.3 Water Pumps

There is 1 Water pump with 2HP capacity.



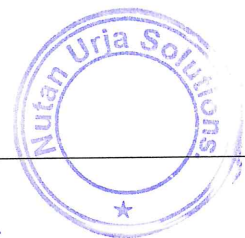
6. Study of usage of LED lighting

In this chapter we study the lighting system of college and compute the percentage of total load catered by LED lighting.

Table 7.1: Total lighting load

No	Particulars	Qty	Load, W/Unit	Load, kW
1	CFL	2	24	0.048
	LED lighting load			
1	LED tube	65	20	1.3
	Total LED lighting load			1.3
	Total Lighting load			1.348

It can be seen that out of total lighting load 96% load is LED lighting load.



7. Study of usage of alternate energy

In this Chapter, we compute the percentage of Usage of Alternate/Renewable Energy to Annual Energy Requirement of the College. The College has installed Roof Top Solar PV System. The Installed Capacity of Solar PV Plant is **12 kWp**.

Table 7.1: Computation of % Usage of Alternate Energy to Annual Energy Requirement

No	Particulars	Value	Unit
1	Annual Energy Purchased from MSEDCL	1,940	kWh/Annum
2	Energy Generated by Roof Top Solar PV System	18,000	kWh/Annum
3	Total Energy Requirement of College	19,940	kWh/Annum
4	% of Usage of Alternate Energy to Annual Energy Requirement	90	%

Photograph of Solar PV plant



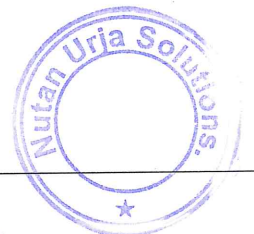
8. Energy conservation proposals

8.1 Replacement of old fans with STAR Rated fans

During the Audit, it was observed that there are 29 no of fans. It is recommended to replace these old fans with STAR Rated fans.

In the following Table, we present the savings, investment required & payback analysis.

No	Particulars	Value	Unit
1	Present Qty of Old Ceiling Fan fittings	29	Nos
2	Energy Demand of Old Ceiling Fan fitting	65	W/Unit
3	Energy Demand of STAR Rated Fan	52	W/Unit
4	Reduction in demad	13	W/Unit
5	Average Daily Usage period	4	Hrs/Day
6	Daily saving in Energy	1.508	kWh/Day
7	Annual Working Days	250	Nos
8	Annual Energy Saving possible	377	kWh/Annum
9	Rate of Electrical Energy	11	Rs/kWh
10	Annual Monetary saving	4147	Rs/Annum
11	Cost of STAR Rated Ceiling Fan	2174	Rs/unit
12	Investment required	63046	Rs lump sum
13	Simple Payback period	182	Months



8.2 Summary of Savings

No	Recommendation	Annual Saving potential, kWh/Annum	Annual Monetary Gain, Rs.	Investment Required, Rs.	Payback period, Months
1	Replacement of 29 Nos Old Ceiling Fans with STAR rating fans	377	4,147	63,046	182
	Total	377	4,147	63,046	182



Report
On **Environmental Audit**
Environmental Audit
At
Arts & Commerce College warwat Bakal, Buldana
(Year 2022-23)

Prepared by

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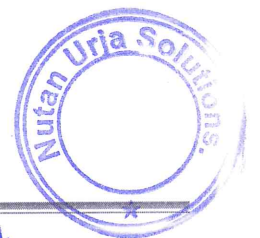
Acknowledgement

We at Nutan Urja Solutions, Pune wish to express our sincere gratitude to the management of Arts & Commerce College Warwat Bakal, Buldana for assigning the work of Environmental Audit of college campus.

We appreciate the co-operation and support extended to our team members during the entire tenure of field study.

We are also thankful to various Head of Departments & other Staff members for helping us during the field measurements.

We are also thankful to all other staff members who helped us during the Measurements at the field and for giving us the necessary inputs to carry out this vital exercise.



Executive Summary

After the Field measurements & analysis, we present herewith important observations made and various measures to reduce the dependency on Natural resources & reduce the pollution.

Arts & Commerce College Warwat Bakal, Buldana consumes various resources for day to day operations, namely: Air, Water, Electrical Energy & LPG.

1. Various Pollution due to College Activities:

- Air pollution: Mainly CO₂ on account of Electricity & LPG Consumption
- Solid Waste: Bio degradable Kitchen Waste, Garden Waste
- Liquid Waste: Human liquid waste

2. Present Level of CO₂ Emissions:

Sr no	Parameter	Energy consumed, (Units)	CO ₂ Emission (MT)
1	Maximum	427	0.34
2	Minimum	-	-
3	Average	162	0.13
4	Total	1,940	1.55

3. The various projects already implemented for Environmental Conservation:

- Usage of Natural Day light in corridors
- Implementation of Bio Composting pit for disposal of Bio degradable waste
- Implementation of Rain Water Harvesting

4. Recommendations:

1. Installation of Bio Gas Generator Plant instead of Bio composting Plant.
2. Installation of Sewage treatment Plant to make campus a Zero Discharge campus

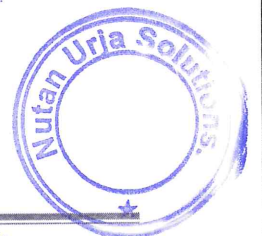
5. Notes & Assumptions:

1. 1 kWh of Electrical Energy releases 0.8 Kg of CO₂ into atmosphere
2. 1 kWp Solar PV plant generates 5 kWh/day Electrical Energy for 300 days in an year.



Abbreviations

AC	: Air conditioner
PES	: Progressive Education Society
CFL	: Compact Fluorescent Lamp
FTL	: Fluorescent Tube Light
LED	: Light Emitting Diode
kWh	: kilo-Watt Hour
Qty	: Quantity
W	: Watt
kW	: Kilo Watt
PF	: Power Factor
M D	: Maximum Demand
PC	: Personal Computer
MSEDCL	: Maharashtra State Electricity Distribution Company Ltd



1. Introduction

1.1 Important Definitions:

1.1.1 Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.1.2. Environmental Audit: Definition:

An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment"

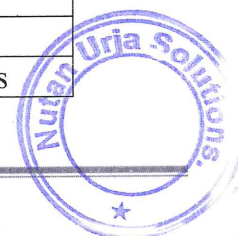
1.1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.1.4. Relevant Environmental Laws in India: Table No-1:

1927	The Indian Forest Act
1972	The Wildlife Protection Act
1974	The Water (Prevention and Control of Pollution) Act
1977	The Water (Prevention & Control of Pollution) Cess Act
1980	The Forest (Conservation) Act
1981	The Air (Prevention and Control of Pollution) Act
1986	The Environment Protection Act
1991	The Public Liability Insurance Act
2002	The Biological Diversity Act
2010	The National Green Tribunal Act

1.1.5. Some Important Environmental Rules in India: Table No-2:

1989	Hazardous Waste (Management and Handling) Rules
1989	Manufacture, Storage and Import of Hazardous Chemical Rules
2000	Municipal Solid Waste (Management and Handling) Rules
1998	The Biomedical Waste (Management and Handling) Rules
1999	The Environment (Siting for Industrial Projects) Rules
2000	Noise Pollution (Regulation and Control) Rules
2000	Ozone Depleting Substances (Regulation and Control) Rules



2011	E-waste (Management and Handling) Rules
2011	National Green Tribunal (Practices and Procedure) Rules
2011	Plastic Waste (Management and Handling) Rules

1.1.6 National Environmental Plans & Policy Documents: Table No-3:

1.	National Forest Policy, 1988
2.	National Water Policy, 2002
3.	National Environment Policy or NEP (2006)
4.	National Conservation Strategy and Policy Statement on Environment and Development, 1992
5.	Policy Statement for Abatement of Pollution (1992)
6.	National Action Plan on Climate Change
7.	Vision Statement on Environment and Human Health
8.	Technology Vision 2030 (The Energy Research Institute)
9.	Addressing Energy Security and Climate Change (MoEF and Bureau of Energy Efficiency)
10	The Road to Copenhagen; India's Position on Climate Change Issues (MoEF)

1.2 Objectives

1. To study present usage of Natural resources the College is consuming
2. To Study the present pollution sources
3. To study various measures to make the campus Self sustainable in respect of Natural resources
4. To suggest the various measures to reduce the pollution: Air, Water, Noise

1.3 Audit Methodology:

1. Study of College as System
2. Study of Electrical Energy Consumption
3. Study of CO2 emissions
4. Suggestions on usage of Renewable Energy

1.4 General Details of College

No	Head	Particulars
1	Name of Institution	Arts & Commerce College warwat Bakal, Buldana
2	Address	Arts & Commerce College warwat Bakal, Buldana ,Maharashtra 444202
3	Affiliation	Sant Gadge Baba Amravati University, Amravati.



2. Study of Consumption of Various Resources

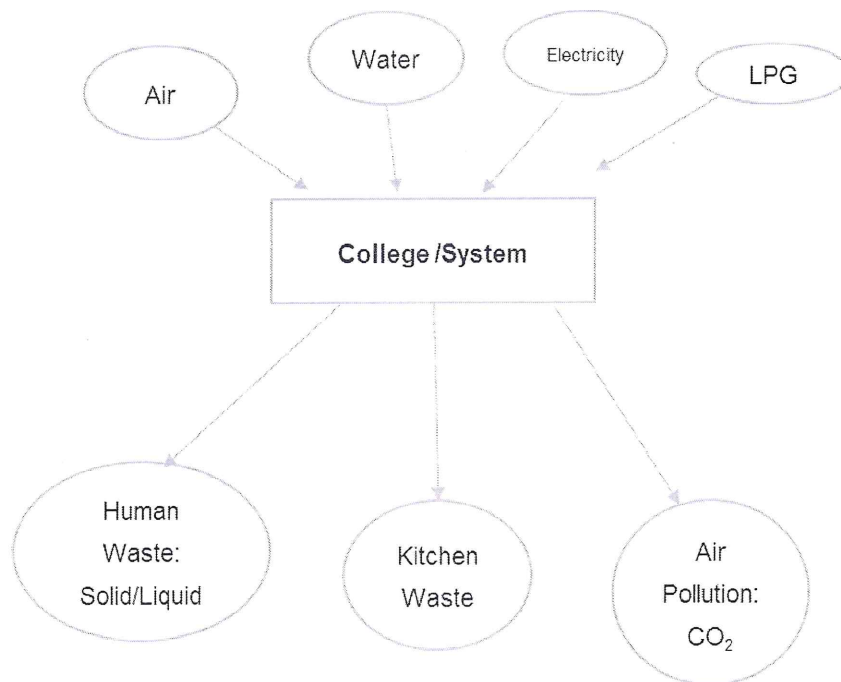
The Institute consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy
4. Liquefied Petroleum Gas

Also, college emits following pollutants to environment

1. Human Waste: Solid/ Liquid
2. Kitchen waste
3. Air pollution

We try to draw a schematic diagram for the College System & Environment as under.



Now we compute the Generation of CO₂ on account of consumption of Electrical Energy & LPG as under.

The calculation of electrical energy consumption by college can be given as,

Table 2.1: Electrical Energy Consumption

No	Month	Energy (kWh)
1	Jun-23	-
2	May-23	148
3	Apr-23	169
4	Mar-23	139
5	Feb-23	99
6	Jan-23	103
7	Dec-22	110
8	Nov-22	101
9	Oct-22	427
10	Sep-22	236
11	Aug-22	212
12	Jul-22	196
	Total	1,940
	Maximum	427
	Minimum	-
	Average	162

2.1 Variation of Monthly Electrical Energy Consumption

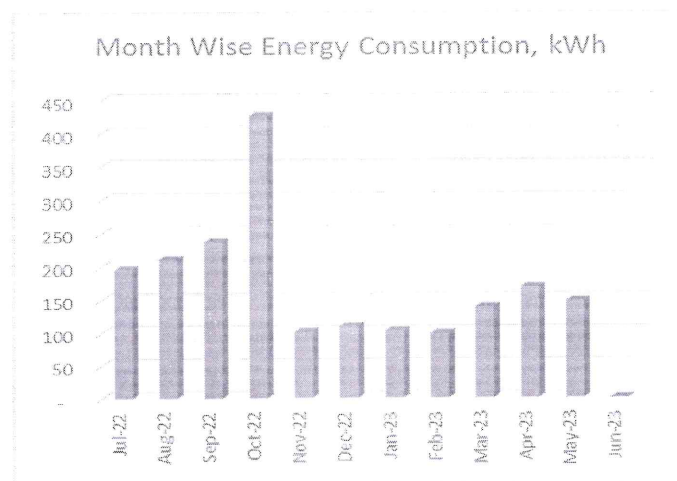


Figure 2.1 : Monthly Electrical Energy Consumption



2.2 Key Inference drawn

From the above analysis, we present following important parameters:

Table 2.2: Variation in Important Parameters

No	Parameter/ Value	Energy Consumed, kWh
1	Maximum	427
2	Minimum	-
3	Average	162
4	Total	1,940



3. Study of Environmental Pollution

In this Chapter, we present the various types of Pollution as under:

3.1 Air Pollution

The College is using two forms of Energies, namely: Thermal in the form of LPG and Electrical Energy used for day to day operations of the College. The major pollutant on account of above Energy forms is the Carbon Di Oxide.

- 1 unit (kWh) of Electrical Energy emits 0.8 Kg of CO₂ in the atmosphere
- 1 Kg of LPG emits 3 Kg of CO₂ in the atmosphere

In the following Table, we present the CO₂ emissions.

Table 3.1: Month wise Consumption of Electrical Energy & CO₂ Emissions:

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Jun-23	-	0.00
2	May-23	148	0.12
3	Apr-23	169	0.14
4	Mar-23	139	0.11
5	Feb-23	99	0.08
6	Jan-23	103	0.08
7	Dec-22	110	0.09
8	Nov-22	101	0.08
9	Oct-22	427	0.34
10	Sep-22	236	0.19
11	Aug-22	212	0.17
12	Jul-22	196	0.16
	Total	1,940	1.55
	Maximum	427	0.34
	Minimum	-	-
	Average	162	0.13

In the following Chart we present the CO2 emissions due to usage of Electrical Energy.

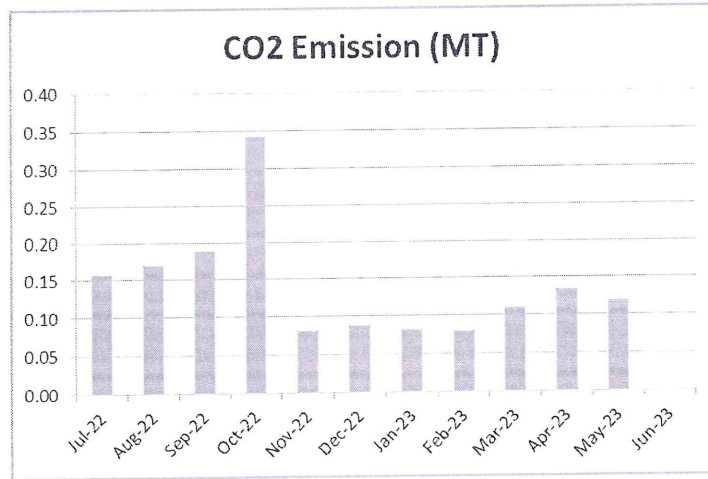
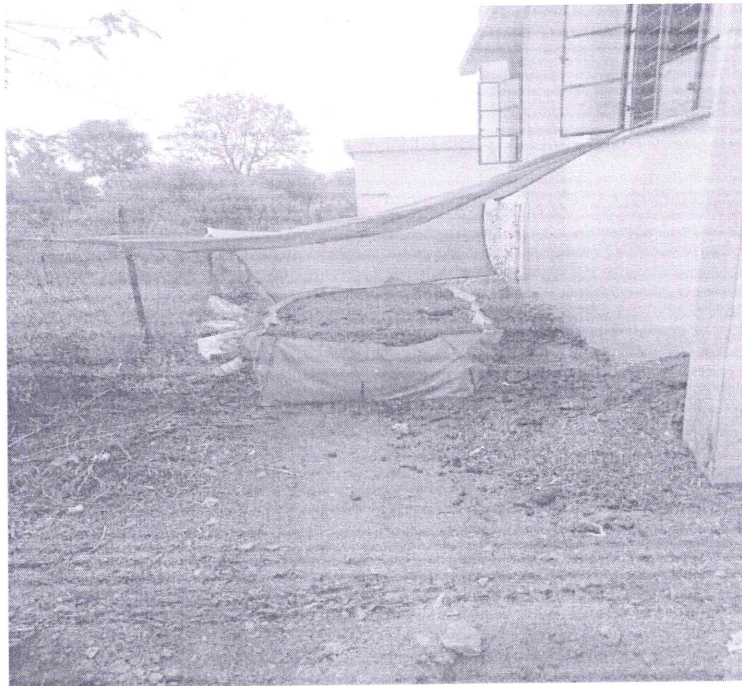


Figure 3.1: CO2 emission due to usage of electrical energy.

3.2 Study of Solid Waste Generation

The College has already installed a Bio composting Plant, wherein, the bio-degradable waste is composted & is used as fertilizer for the garden.

3.2.1 Photograph of Bio Composting Processing Tanks



3.3 Study of Liquid Waste Generation

At present the Liquid Waste generated due to day to day operations is drained off to the municipal Corporation through a pipe.

3.4 Study of e-Waste Management:

The internal communication is through emails and hence there is hardly any generation of e-Waste in the premises.



4. Study of Rain Water Harvesting

The College has already installed Rain Water Harvesting project, wherein the rain water falling on the terrace is collected and through pipes it is fed to underground Water Storage tank. This stored water is then reused for domestic purpose.

Photograph of Rain Water Harvesting:



5. Recommendations

In order to reduce the dependency on Natural resources and also in order to reduce the various pollutions arising due to the day to day operations of the College we herewith recommend following recommendations.

- Installation of Bio Gas Generator Plant instead of Bio composting Plant.
- Installation of Sewage treatment Plant to make campus a Zero Discharge campus



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Date: 21/07/2023

CERTIFICATE

This is to certify that we have conducted Environmental Audit at Arts & Commerce College Warwat Bakal, Buldana in the year 2022-23.

The College has already adopted following projects for making the campus **Energy Efficient**.

- Installation of Bio Composting Pit
- Installation of Rain Water Harvesting System

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green.

Nutan Urja Solutions,



K G Bhatwadekar,
Certified Energy Auditor,
EA – 22428

