International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Learner-Made Rubrics for Self-Assessment in Open Schooling: A Step Towards Holistic Development

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ABSTRACT

In the teaching-learning process, various tools and techniques are being used by the teacher at different levels of understanding, memorizing, and reflection. The relevance of various tools for knowledge gathering, enrichment, and assessment is well acknowledged by research studies around the globe. In order to strengthen the degree of competency of the learner, the latest research studies recognize the wide applicability of rubric not only in performance assessment but also in other different dimensions of development by different means of children with different needs.

In this present study, the researcher aimed to explore the potential of the rubric as a tool to assess targeted skills in a more detailed manner through explicit explanation of performance expectations for the learners of Open School. This paper investigated the impact of using rubrics as a learning and self-assessment tool for improving the science laboratory skills of the learners of the National Institute of Open School (NIOS). The study was carried out in three phases, the pre-intervention, intervention, and post-intervention phase. The quasi-experimental design was adopted with one sample, pre-post test design. As a sample, 28 learners of Senior Secondary (Science stream) of 3 different study centers of NIOS located in Delhi, NCR were selected. Rubric as a tool of self-learning and assessment was used in this study. The science practical was attended by the sample at their respective study centers and the researcher reached the sample in their respective places. Sessions were conducted to prepare the sample about the preparation and usage of Rubrics for their own learning and performance check. The learners were urged to use it to improve their own learning and execution perfection level in their Science practical classes after a series of sessions, once they had a clear comprehension of the preparation and usage. The qualitative interpretation of the findings in the study revealed that the learners got a better understanding and clarity on the expectations of perfection in performing an experiment, which helped them to bring that precision while conducting the practical. Also, it was acknowledged by most of the learners that the rubric helped them to focus on their work, produce work of better quality, and assisted them to earn better grades without feeling nervous about the given task. The descriptive analysis of pre and post-intervention phases revealed that there was a gain difference of 14.95 between pre-test and post-test scores in each dimension of the rubric. The hypothesis testing was done through the Wilcoxon signed rank test (statistical analysis), Z: -3.936, Asymp. Sig. (2-tailed): 0.000, the P value was less than 0.05 ($0.000<0.05$), indicating that there was a significant difference in the performance, and hence, H_0 was rejected. The multiple benefits of using a rubric as a learning and scoring instrument are discussed in this paper. This study promotes the use of rubrics as a learning and assessment tool to enhance the knowledge and skills of learners in formal and open learning environments.

Keywords: Rubric, Open school learner, Assessment tool, Scoring tool, Learning tool, Science laboratory skills, and Process skills.

1. INTRODUCTION:

Learning science requires knowledge and execution of various process skills like observation, measurement, manipulation, classification, inquiry, experimentation, predictions, and reaching to conclusion based on evidence (Brookhart, S. M., 1999). And, over a period of time, in the school system, all these skills are refined in a better manner in the laboratory under the guidance of the science teachers (Hofstein, A., & Lunetta, V.N., 1982 and Hodson, D., 1990). This ultimately helps the student to understand how science works in the real world. Lab work is the hallmark of science education and it has become a mandatory part of the science curriculum in secondary and senior secondary stages, be it regular schools or open schools. Research studies indicated that the learning of Science and its related skills are difficult to grasp for the learners of Open school programs as compared to the learners of regular schools where regular practical classes are held (Cabardo, Jimmy Rey, 2015). The Open School system in India is designed to provide flexible and alternative education options to learners who may not be able to attend traditional schools due to various reasons (https://nios.ac.in/). This system aims to ensure that education is accessible to a wider range of learners, including those who may be working, pursuing other interests, or facing personal challenges. The National Institute of Open Schooling (NIOS) is one of the main organizations responsible for implementing the Open Schooling system in India.

1.1 Features of Open Schools in India

Open schools in India offer flexible admission criteria. Learners of various age groups, including adults, can enroll in different academic programs. This accommodates those who want to continue their education or complete their schooling after a gap. Not only this, open schools provide a range of courses similar to those offered in traditional schools. Learners can choose subjects based on their interests, future goals, and educational needs. The curriculum is also designed to be relevant and aligned with standard educational standards. One of the defining features of open schools is that they emphasize self-study and distance learning. Learners receive study materials, textbooks, and resources that they can use to learn at their own pace. They have the flexibility to study from home or any location with an internet connection. Also, Open schools recognize the diversity of learners and their learning styles. Learners can tailor their study schedules to fit their personal commitments and learning preferences. While self-study is a significant component, open schools often provide tutor support through various means, such as online platforms, study centers, and helpline services. This support is especially valuable for clarifying doubts and seeking guidance. In an open system, the learners are assessed through periodic assignments and examinations. These assessments are conducted by the open school's examination centers. Exams can be taken during specific exam sessions, allowing learners to choose when they are ready to be evaluated. Open schools like NIOS are recognized by the government of India and many state governments. The certificates and diplomas awarded by open schools hold the same value as those from traditional schools and are accepted for higher education and employment opportunities. Not only this, Open schools are also leveraging digital technology to provide online learning platforms, virtual classrooms, and multimedia resources to enhance the learning experience. Their aim is to be inclusive by providing education to marginalized groups, differently-abled individuals, and those in remote areas who may have limited access to conventional schooling. The certificates and qualifications obtained through

open schools are equivalent to those obtained through regular schooling. This allows learners to transition seamlessly to higher education or the workforce. Therefore, it shall be true to comment that the Open School system in India provides an alternative pathway to education, catering to the diverse needs of learners who might not be able to fit into the traditional school framework. Along with this, it promotes lifelong learning, flexibility, and accessibility, empowering individuals to pursue education on their own terms.

However, there are certain challenges in the Open and Distance Learning (ODL) system, which hinder the round development of the learner in the true sense. As per the research, one of them is to pursue a career in the Science domain. Research studies revealed that the knowledge and skills pertaining to Science Education of learners qualified from the ODL system are observed to be below the average level when compared to other students of regular mode (Cabardo, Jimmy Rey., 2015). The difficulty of learning science laboratory work may vary based on several factors, including the individual student's background, learning style, access to resources, and the structure of the open school's curriculum. Open schools typically offer flexible learning options, which can both facilitate and pose challenges to science laboratory learning.

1.2 Challenges Faced by Open School Learners in Learning Science Laboratory Work

Learning science laboratory work in open schools can be both challenging and rewarding. The way to succeed is for learners to be proactive in seeking out resources, managing their time effectively, and finding ways to engage with the material and with peers despite the distance. Open schools provide flexibility, but learners need to take responsibility for their learning process to ensure a successful science laboratory education. Science laboratory work often involves hands-on experiments and practical demonstrations. Open-school learners might face challenges if they don't have access to physical laboratories or appropriate equipment. In such cases, they might need to rely on virtual labs or simulations, which might not provide the same level of practical experience. Hence, lack of hands-on experience in Laboratories becomes a huge challenge in the absence of infrastructure and physical resources. Open schools emphasize self-directed learning and independent study. While this can be advantageous for motivated students, it might be challenging for those who need more guidance or struggle with self-discipline. Laboratory work requires close attention to instructions and procedures, making it important for learners to be able to follow directions and work autonomously. Open-school learners may face issues in getting a hold on to the concept and its related skills in the absence of contiguous guidance. Science laboratory work often involves collaboration and communication, which can be challenging in an open school setting where learners may not have the same level of interaction with peers and teachers as in a traditional school. The lack of collaboration and peer learning are also observed as prominent challenges for the open school learners. Further, it was also reported in the studies that Open school learners usually have more flexibility in managing their schedules. While this is the advantage of the open school setting, it also requires strong time management skills to allocate sufficient time for both theoretical learning and practical laboratory work. And, in the absence of proper time management skills and internal motivation, science is just rote memorized for passing the exam. In Science, getting feedback on laboratory work is crucial for understanding and improving one's skills. Open school learners might need to proactively seek out opportunities for assessment and feedback, which could be through online platforms, mentors, or local study groups. Without regular in-person interactions with teachers and peers, open-school learners might need to find ways to stay motivated and

engaged in their studies. Lack of a supportive learning environment and clear goals leads to limited Science knowledge.

1.3 Rubrics as a Tool for Holistic Development of the Learner

Rubrics and their application in Education**:** According to Hafner, J.C., and P.M. Hafner (2003), a rubric is an evaluation instrument that clearly identifies achievement requirements for all aspects of any type of student work, including written, oral, and visual components. It can be used to grade homework, record class participation, or calculate final grades. Both holistic and analytical rubrics are used (Andrade, H., 2008). A rubric separates the given work into its component sections and gives precise descriptions of the elements of each component's qualities, at various degrees of mastery. Three key components make up a rubric: scoring criteria, quality definitions, and evaluation criteria. The elements that judge or take into account when establishing the caliber of a student's work are called evaluation criteria. The requirements for demonstrating a skill, expertise, or requirement in order to achieve a specific degree of success, such as poor, fair, good, or excellent, are clearly laid out in quality definitions.

Holistic rubrics: Several distinct assessment criteria are grouped together and categorized using grade levels or achievement levels using a holistic rubric tool (Mertler, Craig A. 2001). The criteria are taken into account when they are combined on a single descriptive scale. Without evaluating the individual elements independently, the total quality, competency, or grasp of the particular subject and skills is assessed. The criteria established for the examination of the various variables in a holistic rubric may overlap (Wael Salah Mohamed Seyed, E., 2012).

Analytic rubrics: The use of analytical rubrics allows for the comprehensive discussion of many distinct assessment criteria (Mertler, Craig A. 2001). The upper axis of a horizontal assessment rubric contains values that can be stated numerically, by letter grade, or on a scale ranging from exceptional to poor (or professional to amateur, etc.). The evaluation standards for each component are listed on the side axis. Additionally, alternative weightings for various components may be allowed by analytical rubrics. Scores are assigned to distinct, unique components of the performance or product. The usage of analytical rubrics symbolizes assessment on a multidimensional level because they first produce a number of scores, which are then added together to produce a final score (Arter, J., and J. McTighe, 2001). Learners receive feedback on how to improve their performance, and definitions of what is required for each criterion at each level of performance are made plain on the rubric.

How the rubric is developed:

1. Determine the requirements or components that must be present for the student's work to be of a good caliber. At this point, you might even think about choosing examples of outstanding student work that can be presented to students when establishing tasks.
2. Determine the number of performance levels you will include on the rubric and how they will connect to both your personal grading system and the definition of grades used by your school.

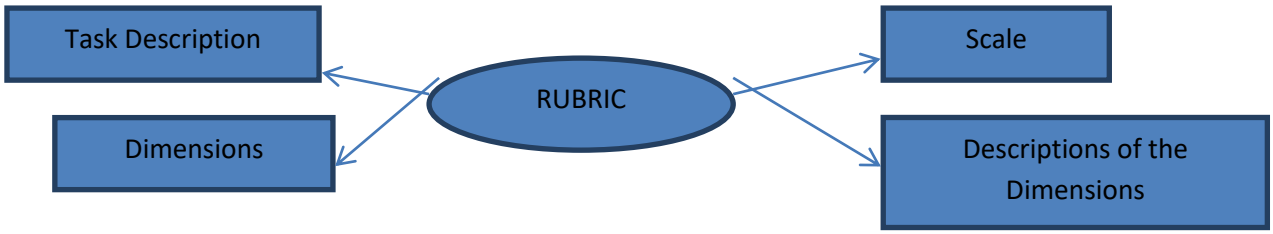

Figure 1: The graphical presentation of Rubric and its main components

3. Describe in detail the performance at each degree of success for each criterion, component, or basic factor of quality.
4. Leave room for additional, personalized remarks or general thoughts as well as a final grade.

2. REVIEW OF RELATED LITERATURE

According to Hodson (1990), practical experience helps stimulate students' interest in learning and teaching. Gibbs. G (1995), promoted the development of more learner-centric assessment methods in place of conventional methods and tools in the open school system. Furthermore, Hofstein and Lunetta (1982) and Hofstein and Mamlok-Naaman (2007), revealed that laboratory activity is crucial to scientific education and aids in the understanding of the distinction between observation and data presentation. Cabardo, Jimmy Rey in 2015 conducted experimental research to know the effectiveness of enhanced learning materials in Science for the Open High School Program. It was observed that the grade 8 students had a beginning level of proficiency in Science in the open and distance learning program. But, after providing enhanced learning material, the scores on the post-test were better in the experimental group as compared to the control group. In the study, Sund (2016) pointed out that many science teachers believe that practical activity is vital and that it aids pupils in learning science. The teaching of science is thought to include both theoretical information, such as concepts and formulas, and actual activity. The empirical case study carried out by the researcher examined the evaluations of two secondary school science teachers of students in three different groups, ages 15 to 16, on the practical portion of a Swedish national test in chemistry. The findings of the investigation showed that because of social interactions and physical causes of mistakes, individual and independent assessments were challenging. According to Sshana, Z.J., and Abulibdeh, E.S. (2020), there exists a correlation between practical experience and the academic success of the majority of science students. In order to enable the significance of practical work to aid students in obtaining higher academic standards, the researcher acknowledged the importance of exposure to practical work and advised that instructors must explore different means to make the experience beneficial for the students. Oliveira H. and Bonito J. (2023) acknowledged in their review study that practical work continues to be observed as a methodology with significant formative value, provided that resources are available to develop it and that different strategies are oriented in accordance with their potential and constraints. Hence, the teaching community must think carefully about how to turn the constraints on practical exposure into possibilities for students of all grade levels in order to make practical science education exciting and profitable for the students. In order to map their opinions on distance scientific education in the years 2020–2021, Stefanidou, C., & Mandrikas, A. (2023) carried out two surveys on primary and secondary students in Greece. The results showed that, with the exception of the growing use of audiovisual materials, students were not satisfied with the distance teaching and learning of science, either in elementary or secondary education.

Studies related to Rubrics in Education revealed the positive effect of using rubrics for bringing expertise in understanding and execution. A study carried out by Wolf K. & Stevens E. (2007) revealed that rubrics help students to self-evaluate and receive feedback from their peers while also clarifying the learning aim, directing instructional design and delivery, and improving the accuracy and fairness of the assessment process. The study also documented that first-generation learners, and from non-traditional environments could all benefit from using rubrics to boost their learning. Mertler (2001) authored about the designing of rubric for performance assessment. Mertler stated that in contrast to checklists, rubrics are scoring scales that are used with performance evaluations and were officially described as scoring guides, which were made up of particular pre-established performance criteria.

After carrying out an extensive review of the literature, it was observed by the researcher that knowledge of process and skills in Science education is of utmost importance and to achieve this, teachers must make efforts in different directions. Also, the practical and laboratory skills should also be honed well in school days. Some studies advocated for the development of more learner-centric assessment methods.

Very few researches on the distance learning of science which could be found and reviewed in this research, had set a general understanding of the strengths and challenges of learning science in a distance learning environment. Through review, it could be understood that distance learners experience a major struggle with the fundamental concepts and process skills and lie at the beginning level of proficiency. The prior knowledge and preparedness for science subjects need to be focussed among the distance learners. It was also highlighted in some of the research that practical laboratory work in science can be a challenge for distance learners due to limited access to physical laboratories.

As a research gap, it was noticed that there are very few studies conducted on the open school system of India, especially on the practical skills of the learners. Therefore, a need for research to be carried out to explore the challenges and concerns of open school and distance learners aspiring to pursue their education and career in the Science field was felt by the researcher.

Hence, the researcher being part of NIOS, one of Asia's largest open and distance schools, decided to work in the area of improving the Science subject knowledge of the enrolled learners. With an objective to explore the potential of the rubric as a tool to assess targeted skills in a more detailed manner through explicit explanation of performance expectations for the learners of the open school, researcher decided to use the Rubric as a tool for learning and assessment of Science practical skills.

3. OBJECTIVE OF THE STUDY

The objective of this study was:-

"To explore the effectiveness of using the self-prepared rubric as a learning and assessment tool for enhancing science laboratory skills of learners of Senior Secondary of NIOS"

4. HYPOTHESIS:

The hypothesis (null hypothesis) framed in the study was:-

H_{01} : "*There will be no significant difference in the laboratory skills of the learners measured through pre-test and post-test scores of the rubrics, administered before and after the intervention*"

5. METHODOLOGY

Methodologically, the present study has a quasi-experimental research design with a qualitative and quantitative approach for data collection and analysis. The data collected before and after the

intervention was analyzed qualitatively through content analysis and descriptive analysis and also, quantitatively through the application of inferential statistics.

5.1. Population and Sample of the study:

In this study, the population is referred to, all the Senior Secondary Learners of the science stream, enrolled within the 3 different study centers affiliated with NIOS. The purposive sampling technique was used for sample selection. As a sample, 28 learners were selected for the study. The quasi-experimental design was adopted with one sample, pre-post test design. It had one independent variable and one dependent variable. Using a rubric as a learning and assessment tool was the independent variable and the skill acquired (science laboratory skills) by the learners in performing science practicals was the dependent variable.

5.2. Study Procedure: The primary objective of the research was to determine 'the effectiveness of using rubrics as a learning and assessment tool in improving the science laboratory skills of Open school learners. This study was conducted in three phases, the first phase which is the pre-intervention phase. The researcher selected the study centers based on the following parameters:-

1) Having Science stream learners of Senior Secondary level
2) Study centers having high and regular attendance patterns of learners

The laboratory skills of the sample were assessed by the researcher by using a rubric (a researcher-made tool). The rubric was developed on 4 important components of science practical i.e. procedural and manipulative skills, observational skills, drawing skills, and Interpretive & reporting skills. In the second phase (intervention stage), the teaching of practicals was done and in the third phase i.e. the post-intervention phase, the laboratory skills of the sample were assessed again by the rubric (post-test tool).

The intervention phase in the study is again divided into three stages, the preparatory, execution, and evaluation stage. To appreciate scientific facts, theories, and laws and gain practical skills, the experiment was taught through these three stages. Here, the self-prepared rubric was used in all three stages by the sample. Since, the objective was to explore how well a rubric may be used as a learning and performance measuring tool, in the intervention phase, a workshop on 'How to prepare and use Rubric for learning and assessment' was conducted by the researcher for the learners. Generally, it was observed that the teacher prepares the rubric and uses it as an instructional and assessment tool, but, this study attempts to find the impact of the rubric when prepared by the learners themselves to assess their own performance. Learners developed rubrics in groups through discussion and brainstorming sessions under the guidance of the researcher. The developed rubric was then used for their own and peer assessment in the next stages of intervention. The rubric was prepared on 3 3-point scale i.e. need improvement, satisfactory, and good scale. A rating of 0 or need improvement represents an absence of that particular behavior; a rating of 1 or satisfactory is indicative of the presence of that behavior but not with perfection and a rating of 2 or good is indicative of the presence of that particular behavior with perfection or near to perfection.

5.3. Tool used in the study:

Rubric: For assessing Science Laboratory skills.

The researcher in a workshop on how to prepare Rubric for self-assessment explained and got the tool constructed on the following 4 parameters (Refer to Table 1.)

- procedural and manipulative skills (35% of the total items),
- observational skills (35% of the total items),
- drawing skills (15% of the total items) and
- Interpretive & reporting skills (15% of the total items).

The researcher got the rubric tool constructed by the learners themselves in various group discussions and brainstorming sessions. The developed tool was further validated by 2 experts (1 from the Research area and 1 from the subject expert), as per the feedback, the tool was further modified and the final version was prepared. The tool was piloted by the researcher to assess its reliability and also to select the appropriate items through item analysis. The internal consistency of the final tool was calculated to be 0.79. After finalizing the tool, it was given to the learners for the final use.

Some of the items of the rubric used for the study:-

Assessment Task	**Performance indicators**		
	Good/2	Satisfactory/ 1	Need Improvement/ 0
Procedural and Manipulative Skills			
Carrying out the experiment independently (following the procedure as described).	Able to carry out the whole experiment without any assistance.	Able to carry out the whole experiment individually but with some assistance	Not able to Carry out the experiment even with some assistance. (need help at every step)
Observational Skills			
Take observations carefully and in a systematic manner.	Able to take observations carefully and in a systematic manner.	Able to take observations carefully with some verbal assistance.	Not able to take observations independently even with some verbal assistance.
Drawing Skills			
To make and put data properly in observation tables.	Able to make and put data correctly in the observation tables.	Able to make and put data correctly to some extent in the observation tables.	Not able to make and put data correctly in the observation tables.
Interpretive and Reporting Skills			
Making a proper plan for recording the observations.	Able to make a proper plan for recording the observations with some verbal assistance in the first attempt.	Able to make a plan for recording the observations with some verbal assistance from the mentor after two or three attempts.	Not able to make a plan for recording the observations even with the involvement/ support of the mentor.

Table 1. Some of the items of the Rubrics

6. FINDINGS AND INTERPRETATION:

It was found in the analysis of the preparing stage, that while preparing the rubric, the learners got a better understanding and clarity on the expectations of perfection in performing an experiment, which helped them to bring that precision while conducting practicals. In addition to this, the learners understood the learning objectives and quality of the delivery of the work. Learners could identify the critical areas in the given work and can perform the task meaningfully. They could decide upon criteria for grading the performance. This also enabled the learners to feel a greater sense of ownership and inclusion in the decision-making process.

The analysis of the second phase revealed that learners were able to perform the practical systematically and in a more organized manner. They did not leave a single key area while performing and reporting the findings of the experiment. The learners agreed that the implementation of a rubric had improved organization and motivation in the classroom. According to the learners, the implementation of a rubric throughout the evaluation stage made the grading process simpler, faster, accurate, and unbiased. It was discovered that the students had the capacity to create reliable conclusions regarding their own work that could guide correction and advancement. It was acknowledged that rubrics helped them to focus on their work, produce work of better quality, and assist learners to earn better grades without feeling nervous about the given work.

The descriptive analysis of pre and post-intervention phases revealed that there was a gain difference between pre-test and post-test scores in each dimension of the rubric.

	N	Mean	Std. Deviation	Minimum	Maximum
Pre-test	28	4.35	5.985	0	17
Post-test	28	19.30	6.408	13	34

Table 2 Descriptive Statistics

The data of Table 2 indicates that there was a gain difference between pre-test and post-test scores in each dimension. The maximum gain score was found to be in procedural and manipulative skills i.e. 6.2 and the gain in interpretive and reporting skills was found to be the minimum i.e. 1.05 (table 3).

Dimensions	Pre-Test Average	Post-test Average	Gain score
Procedural and manipulative skills	2.45	8.65	6.2
Observational Skills	1.1	5.5	4.4
Drawing Skills	0.65	3.95	3.3
Interpretive and Reporting Skills	0.15	1.2	1.05

Table 3 Descriptive Statistics indicating the Gain scores in each dimension

The data of Table 4, indicates that there were no negative scores and there was no decrease in scores after intervention. This means that the intervention did not work in a negative direction.

		N	Mean Rank	Sum of Ranks
Posttest – Pretest	Negative Ranks	0[a]	.00	.00
	Positive Ranks	28[b]	10.50	210.00
	Ties	0[c]		
	Total	28		

a. Post-test < Pre-test

b. Post-test > Pre-test

c. Post-test = Pre-test

Table 4 Ranks

	Post-test – Pre-test
Z	-3.936[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Table 5 Test Statistics

The hypothesis testing was done through Wilcoxon signed rank test statistical analysis, Z: -3.936, Asymp. Sig. (2-tailed): 0.000, P value was less than 0.05 (0.000<0.05), indicating that there was a significant difference in the performance, and hence, H_{01} was rejected (table 5).

"*There was a significant difference in the laboratory skills of the learners of NIOS measured through pre-test and post-test scores of the rubrics, administered before and after the intervention*"

Major Finding:

The major finding of the study was:

The self-made Rubric (learner-made rubric) has brought difference in the laboratory skills of the learners of open school which could be statistically assessed through the difference in the scores of pre-test and post-test administered before and after the intervention.

"Rubric was observed as a potential self-assessment tool in the open learning environment."

7. CONCLUSION:

The self-prepared rubric, as a learning and assessment tool, was found to be effective for enhancing the science laboratory skills of learners of Senior Secondary of NIOS.

It is concluded that using rubrics as a tool of assessment for learners in an Open School setting can offer several benefits, particularly in promoting clear expectations, providing structured feedback, and fostering a more transparent and consistent evaluation process. Rubrics outline specific criteria and expectations for assignments or projects. In an Open School environment where learners might be learning independently, rubrics provide clear guidelines on what is required, helping learners understand

what is expected of them. This tool makes assessment criteria transparent. Learners know how their work will be evaluated, which can reduce confusion and anxiety. It was noticed in the study that this transparency is especially important in remote or self-directed learning scenarios where learners may have limited direct interaction with teachers. Rubrics promote consistent evaluation. Multiple assessors, such as teachers or examiners, can use the same rubric to ensure that the evaluation process is standardized and fair. This consistency is crucial in maintaining the credibility and reliability of the assessment. Rubrics are valuable for formative assessment, allowing learners to gauge their progress and make improvements before submitting final assignments. As in this study, learners used the rubric tool to self-assess their work and make necessary revisions. Rubrics empowered the learners to take charge of their learning and assessment, enabling them to self-evaluate their work and make adjustments accordingly. It was found that as learners review the rubric alongside their work, they engage in reflective thinking and learning. This process encouraged them to think critically about their performance and consider how they can enhance their skills and knowledge.

In conclusion, this study validates that using rubrics as a learning and assessment tool in an Open School setting offers numerous advantages, including clarity, transparency, consistency, and empowerment for both learners and educators.

8. DISCUSSION:

In an educational setup, whenever a rubric is prepared, it assists the developer and the user in articulating the educational idealistic, pragmatist, and realistic philosophy. It is clearly indicated in the rubric where the learner is, what they are expected to do, where they can reach to and what are the means to reach the highest level of expectation (Arter, J., and J. McTighe., 2001). It is concluded in the study that the use of rubrics have contributed significantly to better performance in planning and performing science experiment. It was found that ‘the clearer the learning targets were made to the learners, the more likely they are able to achieve it', and tools like rubrics could assist the learner to move towards perfection in learning. Using a rubric reduces the risk of introducing an unconscious bias component into teaching and evaluation because the assessment process is transparent throughout. It gives room for the development of a universal language for discussing academic work (Brookhart, S. M., 1999). The scope of scaffolding to achieve excellence in one's work and expand one's knowledge is provided by having a scoring guide created by the learners that aims to evaluate the learner's performance based on the sum of a full range of criteria rather than a single numerical score or by making the well-validated rubric available to the learners beforehand (Hafner, J.C., and P.M. Hafner, 2003; Quinlan, A.M., 2006). With this method, the student has the impression that the assessment is being done for them or even by them. The learners experienced that while making judgments about their self-assessed performance, they could think critically, were more skilled, and were more precise. Since students typically believe that grades are assigned by teachers and involve a great deal of subjectivity rather than being earned by students, rubrics in learning and assessment foster a democratic environment in the classroom. However, by using rubrics, students receive individualized, qualitative feedback about their areas of strength and development (Quinlan, A.M., 2006). The use of rubrics enables reflection and meta-reflection on the learning processes of the students, leading to long-term gains in understanding and decreases in student frustration.

9. IMPLICATIONS AND SUGGESTIONS

Using rubrics as a self-assessment tool for open-school learners can have several implications and can greatly enhance the learning experience. Here are some implications to consider, along with suggestions for effective implementation:

9.1. Implications:

1. Promoting Ownership: Self-assessment using rubrics encourages open-school learners to take ownership of their learning. It shifts the focus from external evaluation to internal reflection and improvement.
2. Building Meta-cognitive Skills: For self-assessment to be effective, students must reflect critically on their work and appraise their performance. With the use of this method, students can better understand their strengths and areas for development.
3. Encouraging Autonomy: Open school learners often work independently. Self-assessment with rubrics nurtures autonomy by empowering learners to evaluate their progress and make informed decisions about their learning journey.
4. Developing Self-Regulation: Self-assessment aids in the growth of self-regulation abilities by enabling students to set objectives, track their development, and modify their approaches in response to the feedback from the rubric.
5. Enhancing Reflective Practice: Self-assessment using rubrics prompts learners to reflect on their work and learning process. This reflective practice deepens understanding and promotes continuous improvement.

9.2. Suggestions for the affiliated institutions of the Open Schools for Effective Implementation:

After carrying out this research, it was observed that by incorporating rubrics as a self-assessment tool, open-school learners can actively engage in their learning process, develop critical skills, and work towards achieving higher levels of understanding and proficiency. The approach encourages responsibility, autonomy, and reflective learning, which are crucial for success in self-directed learning environments. Hence through this study, the researcher suggested to the affiliated institutions and other State-open schools to kindly consider the following suggestions:-

1. Provide Clear Rubrics: Design rubrics that clearly outline the assessment criteria, expectations, and different levels of performance. Ensure that learners understand how to interpret the rubric.
2. Introduce Rubrics Early: Introduce rubrics to learners at the beginning of a learning unit or assignment. This gives them a roadmap to follow and helps set expectations from the start.
3. Model Self-Assessment: Demonstrate the self-assessment process to learners using sample work and the rubric. Show them how to objectively evaluate their work against the criteria.
4. Guide Self-Reflection: Encourage learners to reflect on their work in light of the rubric. Ask questions like, "What aspects of your work meet the criteria?" and "How could you improve in areas where you didn't meet the criteria?"
5. Set Clear Goals: Encourage learners to set specific goals for improvement based on the rubric's feedback. This turns self-assessment into a tool for goal setting and growth.
6. Foster Peer Review: Integrate peer review alongside self-assessment. Learners can evaluate their peers' work using the rubric, enhancing their understanding of assessment criteria and constructive feedback.

7. Regularly Review Progress: Encourage students to periodically review the rubric and their own evaluations. By doing so, they may monitor their development over time and modify their learning tactics as necessary.
8. Celebrate Achievements: Recognize and celebrate when learners meet or exceed certain criteria. Positive reinforcement can motivate learners to continue engaging in self-assessment.
9. Provide Constructive Feedback: As an educator, provide feedback on learners' self-assessments. Offer insights into their self-assessment accuracy and suggest additional steps for improvement.
10. Encourage Iterative Improvement: Emphasize that self-assessment is an iterative process. Encourage learners to use feedback from the rubric to revise and refine their work.
11. Reflect on Learning Process: Encourage learners to reflect not only on their work but also on their learning process. Ask questions like, "What strategies were effective in meeting the criteria?"
12. Create a Supportive Environment: Foster an environment where mistakes are seen as opportunities for growth. Encourage learners to learn from challenges and to approach self-assessment with a growth mindset.

10. ACKNOWLEDGEMENT

This study was carried out under the guidance of the Chairperson of NIOS, Prof. Saroj Sharma. Her assistance, advice, and consent enabled this study to finish in the intended manner and to make recommendations for the Open School system that would benefit all those concerned. An informed consent was obtained from the participants (learners) before the start of the study. The objectives of the research were explained in advance and approval from the head of the study centers was taken in advance. The researcher declares that there is no conflict and competing interests in this research work.

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