



## The Implementation of Different Types of Rubrics in a Hong Kong Secondary School

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### ABSTRACT

Rubrics were traditionally a perfect choice for assessing performance. Yet, most rubrics and previous research only focused on its traditional summative aspect, limiting its functions, or even leading to some inappropriate usage or misconception of using rubrics. As formative assessment was found to favor low-achieving students, it has become increasingly popular that rubrics can also be used for formative use and help reduce learning diversity. In this study, different types of rubrics in a Hong Kong Secondary School were investigated, which has been a popular tool that has been widely used among various subjects as an assessment tool. The classification of the rubrics based on different learning areas unveiled that distinct learning areas tended to use heterogeneous rubrics, so the implementation and learning outcomes were then reviewed. It was also noted that a rubric was used for formative assessment in a newly developed STEM curriculum, hence the effectiveness was examined.

## INTRODUCTION

Traditionally, a rubric is used to show the expectations of assignments by describing the level of quality and listing different criteria (Brookhart, 2013). The main purpose of rubrics is undoubtedly to assess performances in multi-dimensional aspects, and there are different ways of using rubrics depending on teachers' strategies and subject requirements. Although the traditional way of using rubrics as a summative purpose has been widely used for decades. Panadero & Jonsson (2013) recognized and reviewed that the use of rubrics for formative assessment drew attention increasingly, hence, a study of rubrics in a Hong Kong Secondary School was made by a practitioner.

There are four main types of rubrics divided into two groups (Brookhart & Nitko, 2008). For analytic rubrics, the criterion like dimension and trait can be evaluated separately, formative feedback can be given to students, and actually, it is adaptable for summative assessment by simply combining all the scores for grading. However, this takes much more time for the teachers

to calculate the scores and give individual feedback. Holistic rubrics can be regarded as the opposite of analytic ones since all the criteria will be evaluated simultaneously, the time spent is much shorter and it is typically adopted for summative assessment.

Considering the purpose and descriptions of the rubrics, it could be generic rubrics (also known as general rubrics) that only describe characteristics of the tasks like content and handwriting but not a detailed one. Although no clear and specific guidelines are given, these rubrics can be shared with students and provide them a basic direction to work on, it can also be used repeatedly for several assignments or even several generations. Most importantly, it supports learning without limiting students' creativity and greatly fosters self-evaluation. Conversely, task-specific rubrics would offer descriptions with the specific content of a task, answers, conclusion or even the steps would be shown. This allows easier scoring but is difficult to be shared with students, yet, new rubrics have to be drafted task by task (Brookhart, 2013).

During the design of the rubrics, some teachers wrongly recognized them as the "requirements" or "quantities" of a task. If they only focused on the task or the product instead of the learning outcome (e.g., students can simply search for the facts they wanted through the Internet and gain lots of the marks in the part of "content" by copying and pasting), a quiz would probably be a better choice not only for identifying the learning outcome but also with a grading purpose; or, a checklist should be a good enough for guiding students the directions to learn (Brookhart, 2013).

In addition, some teachers tend to combine the criteria with a rating scale as "rubrics", this would probably draw students' attention to the final marks instead of recognizing their performance to a description. If this does so, there is almost no difference in going back to the old-fashioned way of marking without any explanation. The importance of rubrics should be emphasized with their descriptive feedback nature (Benson et al., 2022).

Since practice and reviews on rubrics with summative purpose are emphasized for decades (Panadero & Jonsson, 2020), the rubrics for formative assessment were the main focus of the study. Rubrics with formative assessments have also been promoted recently since it is believed to be an active and intentional learning process. Teachers can continuously improve students' achievement (Moss & Brookhart, 2019). In the student-centered approach, students could share the rubrics as a "constructive alignment" (Biggs, 1996; Rouffet et al., 2022), i.e., enhancing the alignment of learning, instruction, and assessment. Positive effects were marked in a Science class (Zhang et al., 2022), writing assignments (Rouffet et al., 2022), and a review about a problem-solving project in senior secondary school Mathematics (Heitink et al., 2016). However, no consensus has been reached since the results were inconsistent and different parameters were compared in different cases.

Hence, a review on the use of scoring rubrics for formative assessment purposes was conducted by Panadero & Jonsson (2013). 21 studies were investigated which indicated that in case of having combinations with self-assessment, or other meta-cognitive tasks, can demonstrate a positive effect on the use of rubrics (Andrade, 2010; Halonen et al., 2003), by providing transparency and confidence to reduce students' anxiety about not being ignorant. Among the findings, it has been demonstrated that the rubrics for formative assessment especially favored low-achieving students which can in turn reduce learning diversity. Younger students and girls (Andrade, 2010) were also found to be more beneficial, but a longer duration of practicing, maybe several weeks, was expected to have a clearer effect. Yet, the findings also raised an issue that students would become more goal-oriented (Torrance, 2007) since students may only focus on the area being assessed, nevertheless, their performance did not necessarily affect the students negatively and their studies were even improved by self-regulation. Ironically, the choice of the topic and rubric design did not seem to have a great influence on the effects of the rubrics for formative assessment under the review.

Recently, the Community College of Allegheny County (CCAC) proposed the formative use of rubrics to allow students to amend their assignments after having feedback from their instructors, this practice also encourages students to take the initiative to raise their questions for further improvement. Hence, it draws attention again and may turn into new teaching practice.

## METHOD

This research consisted of three stages. The first stage was about the definition and classification of rubrics based on two books “How to Create and Use Rubrics for Formative Assessment and Grading” and “Assessment and Grading in Classroom”, both were published by Brookhart.

In the second stage, different articles on the topic of “learning and rubrics” were reviewed, since “improvable ideas” and “transformative assessment” are two of the principles in the twelve knowledge-building principles (Scardamalia, 2002) of the 21st century, stress on formative assessment was preferred and the application and findings of the studies were highlighted.

In the third stage, interviews with 12 subject teachers in an English as the Medium of Instructions (EMI) Hong Kong Secondary School, where the author has been working for 10 years, were conducted in late 2021. Apart from interviewing orally about how the implementation of the rubrics worked, the teachers also offered some rubrics they adopted within 5 years. Apart from the task-specific rubrics, there were only minor or even no changes on the rubrics.

Since only one school was interviewed, it cannot represent the whole picture of secondary education in Hong Kong, the validity of the data was reviewed by conducting interviews and collecting students’ work from the subject teachers of the school, a comparison between the rubrics provided by the teachers and the model ones used in the public examinations obtained through the Education Bureau, and also the firsthand observation of the author.

During the process of data analysis, the data obtained were shared and discussed with experts on ten doctoral students about different assessment methods, and a comparison table was listed as a field note summary to point out different rubrics used in different subjects. Lastly, a thematic analysis was conducted by making integrations and comparisons with different articles in the discussion part of this study. These findings aim at showing a real case of how rubrics and relevant content were used in Hong Kong.

## RESULT

Being an international city, fairness and transparent regulations are always placed as the highest priority in Hong Kong to foster various commercial activities. There are similar situations and expectations in the educational field in Hong Kong. Using rubrics is very common that they can be found among almost all subjects because rubrics are usually interpreted to give scores fairly, transparently, and without bias. It could be regarded as an objective measure when being challenged by parents or students. In practice, there is a wide range of rubrics used, which could be a very simple one or one with lots of details.

### Rubrics Used in a School in HK

The rubrics collected in the study were classified according to six different Key Learning Areas (KLAs), language, mathematics, science, technologies, arts, and others to make fair comparisons. A comparison table of the rubrics used is summarized below (Table 1), it is apparently found that only the KLA of Arts adopts holistic rubrics whereas the others adopt analytic rubrics, in addition, STEM-related subjects tend to use task-specific rubrics.

**Table 1. Kinds of rubrics used in different KLA**

KLA	Type of rubrics
Language	Writing: generic analytic rubrics
Maths	Project: task-specific analytic rubrics
Science	Model making: generic analytic rubrics experiment: task-specific analytic rubrics
Tech.	Practical: task-specific analytic rubrics
Arts	Generic holistic rubrics
Others	Video making: generic analytic rubrics model making: generic analytic rubrics

## English and Chinese Language

Rubrics in language courses are mainly found in writing and speaking but not reading and listening. Simple grading is adopted under the title of the content, grammar, and organization, a maximum of 7 marks can be obtained in each title, making up to a total of 21 marks in English writing. One thing special about rubrics is that the descriptions are quite informative, it is a kind of general rubrics that remains unchanged from Secondary 1 to Secondary 6, this is also parallel to the marking criteria in the public examination provided by the Education Bureau. Hence theoretically all the students should be very familiar with the rubrics. Yet, the effectiveness of using the rubrics seemed to be limited. The practice of students does not have any apparent change, when one gets a score of content “5”, grammar “6” and organization “3”, adding up to a total of “14”, does he/she recognize how to improve from these numbers?

“In real practice, we do not follow the rubrics very strictly actually because it is time-consuming. Most likely we will give scores according to our professional judgment. Although subjective, it saves much more time, and the proposed scores do not differ a lot from those using rubrics. Rubrics in writing is more likely just to be a compulsory official document.” An English teacher said.

The rubrics for Chinese writing are even more simplified which cannot help differentiate the grades. No guidelines and descriptions are present in the rubrics but only numbers. The four titles in the rubrics are content, expression, structure, and punctuation, taking a maximum of 40, 30, 20, and 10 marks respectively, making up a total of 100. In Hong Kong, writing is always regarded as the most annoying paper since students can hardly enhance their writing skills by drilling, and the sole use of generic rubrics as a simply scoring platform ought to bear a great responsibility. Much more individual feedback or explicit guidelines are expected from students to spot their weaknesses and they can make amendments and improvements next time.

“Marking Chinese writing is time-consuming! During marking, we will generally classify the quality into three categories in our mind, then further divide the three categories into three to four levels to give corresponding grades.” An experienced Chinese teacher mentioned.

## Mathematics

Rubrics are seldom used in the field of Mathematics since the subject emphasizes accuracy and logical steps. A rare case used before was a presentation on a project about statistics. In the project, students had to make use of their raw data and choose appropriate charts for presenting the information to the whole form. The task-specific rubrics contained four objectives, such as checking if there was any bias in data collection (e.g., all interviewees are female); judging whether a suitable chart was chosen; and reviewing whether the charts were demonstrated with correct formats. A cross-curriculum with computer technology was developed and making diagrams by the software was also assessed. After the presentation of each group, feedback was given immediately and it was expected that the misconception revealed among the public could draw all students’ attention and raise all their concerns, e.g., the use of a broken line graph implies there should be a trend of the data, instead of solely a simplified version of bar charts. With the use of rubrics and practical projects, students were expected not only to know the content but also to apply them in the future.

“Using rubrics in the project was a good attempt, the students need to recognize whether they can apply what they have learned in this demonstration, which helps them to build confidence in handling statistics in the future. By studying the guideline in the rubrics during the sharing, the students made a much deeper understanding towards some common mistakes on graph plotting and presenting, no matter from their own mistakes, or getting inspired from other groups.”

## Science

In Science, different rubrics would be used depending on the nature of the learning activities. In junior form, generic rubrics are usually adopted in model-making activities such as cell models and food pyramid models.

In these activities, the accuracy of content is a key component, e.g., the ratio and size of organelles were strictly examined to identify whether students can grasp hold of a real understanding. In addition, creativity and illustration took another important part, for example, the students had to explain the color they chose in the model since we could not visualize the color

of cells through any kind of microscope, the use of color in the cell model provides rooms for students for imagination, e.g., some students painted the outermost layer of the cell model as blue because they considered cells are mostly occupied by water, some tended to use yellow because they figured out that cell membrane is an oily lipid layer. During the process, teachers could visualize how the students think and they could have a glance at any misconception aroused and guide the students in the correct way of thinking and appreciate the work on the colorful imaginary world of cells.

In addition, a peer assessment was also included so that different groups of students could discuss and judge each other for a more accurate presentation, which further extended their learning and developed their critical thinking skills. In the senior form, task-specific rubrics were often used so that more explicit learning targets can be delivered to students for preparation. Examining experimental techniques and rat dissections, having problem-solving projects such as fire-extinguisher model making are typical examples of rubrics used in Science. By identifying the requirements of the task, students would try their best on memorizing and thinking about the flow of the experiment, e.g., rat dissection, which they cannot get real practice at home.

“Other than marks, the rubrics used in Science emphasize what the teachers are expecting, such as safety issues, making correct labelings and any important process they should be aware of.”

### **Technology**

Subjects in Technology stress practical work and making connections to the real world. Home Economics and STEM education are two of the subjects in the Key Learning Area of Technology.

In Home Economics, students have to learn about food-handling skills and prepare dishes according to the recipes. A highly detailed task-specific rubrics were delivered to each student before the final assessment took place, hence all the students would know the standard and can get prepared for the criteria being assessed. During the assessment, the teacher went through all the groups, and marks were given secretly according to the category descriptions in the rubrics. Knowing the criteria, some students would still fail to meet the requirements due to pressure and inappropriate daily practice, e.g., having poor clean-ups and using the wrong tools for handling food. The assessment form would be returned to students at the end to remind them and draw further attention, especially to food safety issues.

“Using rubrics in Home Economics helps students to spot a clear objective. These practices remain unchanged from lesson 1 till the last lesson, hence it is better to say the rubrics serve as a regulation in the subject.”

The STEM curriculum was a newly established subject in 2019. Food science was chosen to be the main theme for Secondary 1 students to match the curriculum with Home Economics. Within the 8-day-curriculum on alternate weeks, students were expected to judge and evaluate the nutrition value of a meal and make recommendations if it is used to serve the elderly. A formative assessment was adopted in such a tight condition, the task-specific rubric would also be delivered to students in the third lesson, then each student had to make an introduction and evaluation of their meal following the rubrics in the fourth lesson. In the rubrics, four aspects were concerned including using appropriate scales and adjectives to describe food, making use of the concept of a balanced diet, being able to recognize the correct way of storage of food, and making suggestions for the meal of the elderly.

Individual feedback would be given orally to amend if there is any discrepancy, e.g., most students cannot illustrate the concept of a balanced diet accurately during the first time of presentation, some simply consider a meal with carbohydrates, lipids, proteins, and vegetables to be a balanced diet; moreover, some students failed to express the degree of adjectives using scales or quantitative expressions. After the evaluation, a final report and presentation would be delivered by students again in the last lesson, great improvements were shown, for example, an explicit definition of “balanced diet” could be given, and more specific terms like “food wrap” and “upper part” of the fridge were mentioned.

“It is challenging. We have only got 8 lessons and the rubrics can guide them and promote self-regulation during the two presentations. In addition, students’ anxiety is found to be reduced

since they are not ignorant. I am sure that the effectiveness and the depth of the content would be even better if we could have more lessons.”

### **Arts**

Visual Arts and Music are the only two subjects in the Key Learning Area of Arts. Traditionally, their assessment is regarded as highly subjective.

In the level descriptors provided by the Hong Kong Examinations and Assessment Authority (HKEAA), the products were classified into five levels by generic rubrics. For instance, a student awarded level 5 in Visual Arts was expected to show creativities and well thought out ideas, and has high competency in exploring and using various appropriate sensory descriptors through languages and media, and one awarded level 5 in Music was expected to exhibit outstanding listening skills and excellent ability in identifying and notating music elements; and were able to demonstrate comprehensive knowledge of the compositional devices, artistic qualities of diverse music genres and styles in connection with various historical and cultural contexts.

Yet, there were still differences between the assessment of the two subjects. To be less subjective, candidates for Music had to sit for a listening examination which contributed 40% of the total marks. Unlike Music, the two papers for Visual Arts were arts appreciation and making, and practical design, hence all the content was assessed subjectively.

### **Others**

There are still several subjects in secondary school making use of rubrics as an assessment tool, for instance, a video-making project was held in Economics, which encouraged students to apply their knowledge learned in explaining the daily phenomenon. Generic rubrics were adopted to assess their validity, accuracy, and creativity.

Similar to Biology, model-makings are common inspiring learning activities in Geography, developing a 3D contour map, and showing types of plate tectonic boundaries were conducted with the aid of generic rubrics. In addition, with the promotion of STEAM education, a film-making project with drones was held recently to study the unique landscape of the geological park - the eroded sedimentary rock in Tung Ping Chau and hexagonal rock columns in Sai Kung. Fascinating films produced introduced the background of the landform and ended with the issue of conservation. Although they were assessed with a generic rubric, the feedback from students was astonishingly perfect since they benefited a lot from the advanced technology and the field trip, and the incredible experience of controlling drones by themselves.

Unexpectedly, Chinese History also made use of general rubrics to arouse students' interest through model designs. Models of unfamous Chinese weapons were made during interclass competitions, and students had to demonstrate the use of the weapons during assemblies, drawing lots of applause. A simple generic rubrics were adopted since the learning outcome was not the main theme but making inspiration.

## **DISCUSSIONS**

The academic performance of students is increasingly under parents' concern; using rubrics could be a way to satisfy the need of parents since they can grasp hold of the teaching progress and the content or skills required. Adjustment or further improvement can be provided or cooperated with parents, yet the effectiveness can be investigated.

Although rubrics can assess multi-dimensional performance, drafting and marking according to a detailed guideline takes enormous time; some has even solely become official documents instead of for teaching and learning purpose. In addition, the way to implement rubrics greatly depends on the nature of the tasks and the class size. Hence, most rubrics tended to be viewed inefficient, and only adopted by pre-service teachers (Fahrer, 2019). Further research studies can be conducted to figure out how an equilibrium should be reached.

Among the studies, Panadero & Jonsson (2013) pointed out that gaps do exist in the formative use of rubrics. Although generic and analytical rubrics are believed to be most suitable for formative assessment, there are still different designs of rubrics including holistic rubrics and task-specific rubrics. First, the Hong Kong school in the study provided a new trial of using task-specific and analytic rubrics for formative assessment, and the outcome (attached in the



appendix) was encouraging. Students did improve a lot with the combination of new rubrics and formative assessments. Further studies can be done on the principle behind it.

Second, the study on personal differences in individual learning is severely in lack (Panadero & Jonsson, 2013). With the implementation of rubrics, we could not identify whether there would be any positive or even negative effects on creativity, which would then alter the goal orientation and self-regulation strategies. Hence, the linkage between different individual factors and the final results are expected to be deeply investigated via a mixed methods research design. On the other hand, a collaboration for inquiry-based learning using rubrics is getting popular recently (Wallace & Husid, 2011) due to the introduction of twelve knowledge-building principles for the 21st century (Scardamalia, 2002) under the era of information (Zhang, 2021).

Third, since most of the rubrics designs are used together with meta-cognitive activities, it is really difficult to spot the effectiveness of rubrics solely. Among the activities, the influence of using peer assessment is expected to be the highest, yet it does not catch the eye of researchers (Schamber & Mahoney, 2006). The effects of the combinations or rubrics alone can be studied to find the best way for supporting students' learning.

Fourth, as there is a significant finding on rubrics are favorable to female (Andrade, 2010), a clarification on the relationship between gender and the type of rubrics used becomes essential. This should be treated with great care since not all the rubrics were covered in the study. Especially when girls are traditionally believed to be more art-liked instead of STEM-related, would it be getting biased from the corresponding rubrics found in the study, that is, whether the situation would reverse if task-specific analytic rubrics are used in the study (Harwood et al., 2020). Another finding also revealed that only participation in the rubric design and moderation discussions could help develop skills in Arts (Menéndez-Varela & Gregori-Giralt, 2018), so the way of implementation of rubrics should also be reviewed to ensure fairness (Panadero & Jonsson, 2020).

Last but not least, understanding how the students make use of rubrics as their tools for self-regulation perhaps would be a very important issue (Efklides, 2011), other studies stressed the importance of high transparency, which help students to identify an accurate learning goal, which in turn foster students to take responsibility for self-regulation (Bertolini et al., 2021; de Boer et al., 2021; Hasselquist & Bertolini, 2018). Furthermore, the use of rubrics in learning assessment can minimize the teacher's overly subjective practice in assessing and reduce students' academic dishonesty behavior (Surahman & Wang, 2022). Further investigations could be conducted to see if different learning methods may help develop and inspire heterogenous student learning outcomes.

## CONCLUSION

To design useful and effective rubrics, the criteria ought to be appropriate, definable, observable, and different from one another (able to include the learning outcome from high to low). Yet, from the examples of a Hong Kong Secondary School, the application of rubrics should depend on the needs and teaching strategies; general rubrics favor the development of creativity and exploration when concrete feedback is given. Task-specific rubrics are usually used on subjects with lots of skillful items to illustrate the safety issue and explicit requirements. In addition, the implementation of rubrics for formative assessment successfully demonstrates a significant improvement, although much more time has to be spent. Although the sample size was not large, the validity has been supported by comparison with the government's reference and the author's firsthand observations. These findings would be useful as a real case of adopting rubrics and relevant content in Hong Kong were shown.

Concerns from parents, relations between using different rubrics with favorable genders, individual learning, and the ways that students take rubrics as a learning tool are yet to be further discussed and investigated. With the proposal of twelve knowledge-building principles, perhaps a new type of rubrics used by collaboration for inquiry-based learning would develop swiftly.

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