

Grading Papers: Basic Teaching Skills Beyond the Teaching of University Teachers

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Abstract: The basic teaching skills of teachers are not limited to teaching, but also reflected in many aspects such as planning, preparation, tutoring, correcting homework, and grading test papers. The work related to grading papers is an important teaching activity and a fundamental skill that teachers should not overlook. Due to insufficient attention from teaching authorities and teachers themselves, the lack of standardization in grading papers often becomes a major challenge in various teaching inspections. This paper takes programming test questions as an example to clarify the relevant concepts in grading papers, clarify the principles that should be adopted during grading papers, and the handling methods for some special problems, in order to help teachers complete the grading work more normatively and effectively.

Keywords: Basic teaching skills; Grading papers; Evaluation criteria; Normalization of test papers

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1. Introduction

In recent years, although colleges and universities advocate teachers to strengthen basic skills training, such as holding teaching competitions. However, there has been little discussion and research on other teaching processes in an organized way, such as the organization and grading of test papers, and writing standards for various documents such as teaching calendars, manuals, and guidebooks.

Examination is a means to test whether learners have mastered the content they should know, and examination paper is the most basic tool. In principle, the normalization of test papers involves many aspects such as the normalization of format, the normalization of expression and the normalization of scoring, while the validity involves questions such as reasonable form, effective evaluation criteria, qualified calculation method, and whether practical examination should be adopted^[1-4]. The normalization of the grading work comes from the correct understanding of teachers about the relevant basic issues, or the solid degree of basic skills in this respect. Here is only a brief discussion of the preparation before the exam and the grading after the exam, especially some common problems in the grading process.

2. The Preliminary Preparation of Grading the Test Paper

2.1 The reference answer to the test paper

Test answers are usually reference answers, because a large number of questions in a college course do not always have a standard answer. Strictly speaking, the exam does not necessarily require a separate reference answer, which can be incorporated into the grading criteria. However, the Educational Administrative Department generally requires blank papers to be used for each examination to give the answers and grading criteria, mainly for the purpose of clear expression and easy verification. When there are no very special circumstances, the requirement should be followed, which is also conducive to the normalization. However, as a result, teachers often confuse test answers with grading criteria. For example, most grading criteria only give the answer to the question (the score of each question has been marked at the end of the question), or on this basis, simply divide the questions that exceed the specified score (the

maximum score point) into several small parts and provide score markers to replace the scoring criteria.

2.2 Establishment of Grading Criteria

In any test, the test maker or designee should determine clear and accurate grading criteria (or evaluation criteria) according to the purpose of investigation and acceptance requirements, so as to determine which situations are correct answers and which situations are wrong answers^[5]. Even if there is no standard answer to a question, there must be a grading criterion to serve as a basis for giving different scores. Don't confuse test answers with grading criteria. The grading criteria are usually given in the form of a list of scoring points, with necessary textual explanations. In essence, good grading criteria can reduce the professional level requirements for reviewer.

A course in a university is often taught by several teachers in different classes and is subject to the same standard because the object, goal and requirements of the course are the same.

3. Score and Go Over Examination Papers

3.1 Grade based on scoring point

The grading is based on the scoring points. The scoring points refers to the key points scored in the answer, in other words, as long as the points are complete and correct, it is considered that the answer is correct.

Different questions may adopt different scoring methods, including problem solving ideas, calculation results, expression, grammar, wording and so on. For the program design questions, we can consider to design the grading criteria according to the scheme, the overall framework, the commonly used technology (method) and the grammatical correctness. And we can also consider to design the grading criteria according to the components of the program and the correctness. Figure 1 shows a reference answer to a programming question in C programming for the purpose of calculating the sum of k² up to 1000, and Figure 2 is an example of a grading criteria designed according to the component (scoring points).

```
#include <stdio.h>
int main(int argc, char* argv[])
{
    int k;
    long s = 0;
    for(k=0; k<1000; ++k)
        s += (long)k * k;
    printf("sum=%ld", s);
    return 0;
}
```

Figure 1 The sample of reference answer

```
7 #include <stdio.h> ✓
int main(int argc, char* argv[]) ✓
{
    int k;
    x int s = 0 ✓ -1
    for(; ✓ k<1000; ++k) ✓
        s += (long)k * k;
    printf("sum=%d"; ✓ s); ✓
    return 0 ✓ -2
}
```

Figure 3 Grading Sample of test questions

- (1) header file contained, 1 point.
- (2) main function, 1 point. Use "void" type, no functional parameter and "return" sentence (or use return, sentence), correct.
- (3) preparation of variable, 2 points. And wrong data type of variable "S", deduct 1 point.
- (4) Loop Structure, 5 points. the "while" and "do while" loops can be used to instead of the "for" loop, Construct a loop with "goto" sentence, deduct 1 point; Incorrect variable initialization, deduct 1 point; Incorrect loop termination condition, deduct 1 point; Other grammar errors, deduct 1 point; Non cyclic structure or other serious errors, no score.
- (5) Result output, 1 point. Data type description error, no score; If the variable type matches the output type, both are of type "int" or "float", only deduct 1 point at (3), no points deducted at (5), no text prompts, no points deducted.

Figure 2 Sample of grading criteria

A clause implied in the scoring points (1) to (5) in the above criteria is that the corresponding scoring point code is not written out, 0 points. Taking the score point (3) as an example, the actual possible scores are 2, 1, and 0. Figure 3 shows the scoring given to this question in an answer paper.

In Figure 3, the point reduction system is adopted. Of course, the bonus point system can also be adopted. What is important is that the same scoring method is adopted for the examination papers of one exam. The figure clearly shows the inspection and judgment of 6 points, and the marks clearly indicate the basis of scoring without missing scoring points. Even if all the subjects answered correctly, indicating whether all the scoring points were correct would make it easier to check the paper (of course, it can also be clearly

expressed with a check mark).

The score point(6)can be listed in more detail,but it is usually not necessary for programming questions.The score point(4)is the highest score point,and it is usually required that the score of all points should not exceed 5 points.Otherwise,it should be broken down into more detailed points.

3.2 The score point is not the same as the score of the question

Sometimes,scoring points are misinterpreted as scores for the question.In fact,if the total score of a question does not exceed 5 points,it cannot be split,which means that there are only two kinds of scores for the question,5 and 0.Even so,the grading criteria should state when 0 points are awarded,rather than just giving the total score.For example,for a strict exam,the following scoring points could be used instead of the initial criteria(4):“(4)Loop structure,5 points.Any kind of loop can be used instead of the“for”loop;No score will be given for any grammar or logical errors

It should be said that there is also a Conventional term implied here:no answer,0 points.Under this standard,as long as a mistake is marked,it will be awarded 0 points.

For an answer to a question,the grading criteria should indicate what is correct(given by the reference answer)and what is wrong(given by the grading criteria).Generally speaking,each score value given for a question(including the score point)should be accurately explained in the grading criteria,which has nothing to do with the score of the score points,and can be understood as the refinement or decomposition of the score points.For example,in the initial grading criteria,although the total value of the score point(4)is 5 points,it is possible to obtain any score value from 0 to 5.At this time,the description in the grading criteria is actually an interpretation of each score value,which is equivalent to refining it into 5 score points,that is,the score point(4)itself is not an independent point in the strict sense.

The determination of the score points should be fine and not coarse,accurate and not vague,no ambiguity,and can not only be clear in the mind of the designer of the criteria.For example,the design of score point,“subtract 1-2 points for some grammar errors”,has obvious defects and unclear standards,which is difficult to evaluate whether the score is accurate and reasonable.And it can be amended to:“If there are no more than 2 grammar errors,deduct 1 point;If there are more than 3 grammar errors,deduct 2 points.”

3.3 Marks used for evaluation

Examination and grading paper are a kind of vital teaching or inspection activity,which has a great influence on the subjects.The reviewed test paper should be clear and easy to understand,especially capable of withstanding scrutiny and various verifications.Marks used to grade paper mainly include text, \checkmark , \times ,and-(horizontal line).In theory,it is possible to use words or tables to record the reasons for errors in the answers to questions,but which means a huge amount of work and is not necessary in general tests and examinations.In general,it can be handled as follows:

- (1)Mark with a“ \checkmark ”after the correct scoring point;
- (2)Mark the error points with a“ \times ”to indicate the subtracted score
- (3)Mark the score with“ \checkmark ”after the answer that contains partial errors,indicate the subtracted score,and add a clear mark in the specific error.

The symbol“-”(or other)can be used to mark minor errors that can be combined into a single error(equivalent to a scoring point to avoid fractional points).Of course,in addition to“ \checkmark ”and“ \times ”,other symbols are not strictly prescribed,but the conventional and intuitive meaning of symbols should be kept unchanged as far as possible(such as“ \checkmark ”means not completely correct).At the same time,it is also important to maintain an acceptable and consistent style(e.g.,the markers are all on the right).

The reason why it is not necessary to give too much text to the test paper is that the test paper is not returned to the subject,and the grading paper of course exam often has a tight time requirement.For homework and lab reports and other documents,we should explain the error or the reason for minus points as far as possible,in order to guide students to think and improve.

The grading mark should be red to highlight the expression.If a change is made to any mark,it must be signed nearby to indicate that the change was made by the reviewer himself.

3.4 When there is no standard answer or there are multiple answers

Questions with no standard answers are more enlightening and should be highly valued by teachers,and can often be used to test whether students can creatively and comprehensively apply the basic principles they have mastered to solve practical problems.However,it is not that scoring criteria are not unnecessary.Questions with multiple answers are similar to questions with no standard answers.

In these cases,reference answers and grading criteria should be designed to list as many possible correct responses as possible. When there is a correct solution that the designer has not considered,the reviewer should report the situation to the designer,discuss together,and include it in the grading criterion and reference answer after there is no objection.

In short,a good test paper evaluation should be accurate,unmistakable,clear,concise and beautiful.At the very least,when only the grading criteria,the reference answers and the test paper are provided,the test paper reviewer can easily read it without any explanation and make a proper evaluation of the quality of the grading paper.There is no essential difference in the design of the grading criteria and the grading method for examination papers,assignments or lab reports.In addition,in order to reduce the errors in the score and the difficulties of paper document preservation,electronic grading is a recommended way.

4. Conclusion

Grading paper seems simple and routine,but is a basic teaching literacy that many university teachers,especially young teachers,do not possess.Over the years,the teachers of science and engineering universities have rarely come from normal colleges and universities.And colleges and universities are more interested in the scientific research and academic ability or work experience in enterprises of new teachers.It is difficult to see the educational administration department or the teaching and research department of the university to discuss these issues.Teachers'basic skills training mostly rely on their own understanding. And when the evaluation comes,this is exactly the evaluation where experts attach importance to.Long-term accumulation leads to many and complicated problems,and even teachers do not know how to rectify them to satisfy the supervision team and assessment experts.Therefore,the educational administration department cannot simply do or take an evaluation index,but also convert these indicators into norms in peacetime,so that teachers can understand what should be done right or well.Training should be taken to make it a conscious habit of teachers.

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