ARE ZEROS FAIR?
AN ANALYSIS OF GRADING PRACTICES

by

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INTRODUCTION

Rick Wormeli (Wormeli 2006) defines a grade as “an accurate, undiluted indicator of a student’s mastery of learning standards.” It is “not meant to be a part of a reward, motivation, or behavioral contract system.”

Students do not always do the work that you ask of them. This is just a fact of the educational system. The result of failure to do work is often no credit or a zero. A common grading practice in the United States is a 100-point grading scale with an “A” being 100-90%, a “B” being 89-80%, a “C” being 79-70%, etc. This grading system seems, at first, to be fair since most teachers have used nothing but this scale. Unfortunately, when zeros are included in an average the mathematics are skewed to the point of being nearly worthless. The reason this is so is because of the disparity of the point range within each grade. An “A” has a ten-point range as does a “B”, “C”, and “D” while an “F” encompasses a range of 59 points (0-59%).

The flaw in the system is that a 100-point grading scale does not mathematically equalize zeros to have the same weight as other scores. This paper presents the view that zeros are not fair to anyone including students, parents, teachers, and society as a whole.

When this paper asks “Are Zeros Fair?”, what is really being asked is “Are Zeros Fair on a 100-Point Grading Scale?”

WHY ZEROS?

A survey [Figure 1.] that I conducted of local area teachers included my own school, Armstrong Middle School in the Bristol Township School District in Bucks County, Pennsylvania. The results showed that the overwhelming consensus was to continue to use zeros as a grade. This survey asked questions such as (1) How do you grade your students? (2) Do you ever give zeros? If so, for what? (3) Do you accept late work? (4) If you do give zeros, have you ever thought about changing this practice and giving a failing grade of 50%?
Teachers are averse to having a school administrator mandate to them to give 50’s instead of zeros. For many teachers it is felt this would be giving free points away to students who they feel do not deserve credit when no work was done. The far majority of teachers surveyed give zeros when work is not completed by a student. However, the survey results also showed that most teachers did allow for late assignments to be handed in. This, in itself, is helpful to motivate students to complete assignments.

When asked, teachers, in general, give varied answers as to the purpose of grading. Thomas Guskey (Guskey, 2004) found reasons such as:

1. communicating the achievement status of students to parents;

2. providing information for self-evaluation for the student;
(3) identifying individuals for specific educational paths;

(4) providing incentives for student learning;

(5) evaluate effectiveness of instructional programs;

(6) provide evidence of student’s lack of effort or inability to accept responsibility for inappropriate behavior.

He found that many teachers use zeros as their “ultimate grading weapon.” Frustration at a teacher’s inability to force a student to do work can lead to using grades as punishment. Grading was never intended for this purpose. When punishment is used as a part of a student’s grade, we skew the actual grade of academic progress. Rick Wormeli (Wormeli, 2006) stated that “We fail students when we misuse grading practices on the pretense of teaching accountability.”

THE MATHEMATICS OF ZEROS AND GRADING

A simple analysis of the mathematics of including zeros when averaging grades shows the problem with the 100-point scale. A comparison a 100-point grading scale versus a 4-point grading scale is shown below [Figure 2.] The process of actually using the 4-point scale may be uncomfortable for some since most people in the United States are more familiar with using percentages.
The use of zeros drastically affects a mathematical averaging of grades. Shown below [Figure 3] is a fictitious student named “Johnny.” Johnny’s scores are shown as points earned out of a possible 100 points and thus can be considered percentages.

Johnny had 14 assignments. He did not hand in three of the assignments. Glancing over the scores that Johnny actually earned, does it appear that Johnny’s average should be a 68%?

Using the standard 100-point scale, Johnny would have a final average of 68%, a “D.” This grade does not show his full ability. In fact, it is a misrepresentation of his true grade and level of learning.
As teachers, we strive to be fair. Until each of use looks at our grading practices, we risk undermining the value of grading.

Using a 4-point scale *still* allows a teacher to give zeros. However, this use of zero is appropriate and mathematically correct. Each interval between grades is equivalent. This is in stark contrast to the 59-point interval spread for failure on a 100-point grading scale. Is the 4-point scale feasible for most teachers? For many teachers, it probably is not feasible at this point. The reason for this is that a drastic change would have to be made in the mindset of administrators, parents, teachers, and students about what constitutes a good grade. Is a good grade a 90% or would a 3.1 sound good? In fact, they are equivalent when comparing a 100-point scale versus a 4-point scale. Unfortunately, to many, it would demand that they change the way they look at grades. One solution would be to present the actual grade in a letter format despite the system being used.

We must abolish the 100-point scale to grade students. It is not fair. The abundance of computer programs for grading can help accomplished this and therefore allow teachers to excel in their ability to grade each student fairly.

<table>
<thead>
<tr>
<th>Actual percentage</th>
<th>100-point scale</th>
<th>4-point scale</th>
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</thead>
<tbody>
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<td>89</td>
<td>3.0</td>
</tr>
<tr>
<td>95</td>
<td>95</td>
<td>3.6</td>
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<tr>
<td>72</td>
<td>72</td>
<td>1.3</td>
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<tr>
<td>85</td>
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<td>90</td>
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<tr>
<td><strong>Average</strong></td>
<td><strong>68.1</strong></td>
<td><strong>2.2</strong></td>
</tr>
<tr>
<td><strong>Percentage</strong></td>
<td><strong>68%</strong></td>
<td><strong>81%</strong></td>
</tr>
<tr>
<td><strong>Letter Grade</strong></td>
<td>D</td>
<td>B</td>
</tr>
</tbody>
</table>
Parents also need to demand that students be graded fairly instead of being left to the mercy of teachers who use grades as punishment and more commonly, the use of a grade-scale that is flawed against the student who may miss a few assignments.

Grades should reflect the mastery of the material being learned. It should not be used as a punishment. Plane and simple, it needs to show only mastery.

Responsibility is something that is often mentioned by teachers as to why they will continue to use zeros. Zeros are not going to teach responsibility to students. It may make a teacher feel better that they “got” the student and basically punished him for his irresponsibility. Responsibility needs to be dealt with separately; not included in an academic grade.

**OPPOSING VIEWPOINT**

On the other side of the coin is Research Director, Justin Torres of the Thomas B. Fordham Foundation, a Washington, D.C. based think tank. He has “not been convinced a better method is out there. He fears those advocating changes are actually softening the standards for students.” (Hetzner, 2004). Grievances have even been filed by teachers in the Auburn City School District in New York after being mandated to give a minimum of 50 points to secondary students.

I do believe that if the data were shown to these teachers, their beliefs would change. The resentment felt by these teachers should be redirected towards the inequity of a failed grading system.

**“WHY SHOULD I GIVE THEM 50% FOR NO WORK?”**

This is probably the most often heard reason from teaches for not wanting to use 50% as a grade for students who do not complete work. What teachers fail to realize again is that their grading system is flawed. Understanding grading from mathematical point-of-view will hopefully change the belief systems in place in many schools across the United States.
Unfortunately administrators who try to enact new polices against zeros are met with opposition from teachers. “You’re not going to tell me I can’t give a student a zero!” This opposition stems from a belief system that students should receive no points for no work. Administrators need to objectively show the flaws in the 100-point grading system so that teachers are more willing to accept the reasons for an alternative method of grading.

Administrators would therefore be empowering teachers instead of mandating their agenda without a valid reason to back it up. If administrators do want teachers to fully embrace the concept of no-zeros, they will have to show the cold, hard data that supports a grading system that effectively uses each grade, including zeros. Without this evidence, teachers are left to wonder if administrators are just letting students slide. It is no wonder that there is often an English-to-English translation problem when teachers and administrators communicate.

**SOLUTIONS FOR ELIMINATING THE ZERO BIAS**

A grading system where every grade is treated equally and weighted the same is the fairest way of including zeros as part of a grade (i.e. a 4-point grading scale.)

James McMillan (McMillan, 1999) also suggests some practical solutions to the problem of zeros statistically skewing a mathematical average:

1. Use the bottom of the actual grading scale and keep the spread the same as between other grades.

2. Use zeros for a very small percentage of the final grade.

3. Give effort a separate grade.

4. Use indicators of effort, including zeros, only for borderline grades.

5. Simply ignore zeros if the student has done an exemplary job with everything else.
6. Use the median rather than the mean to show a more accurate measure of central tendency.

7. Allow extra credit to cancel out zeros.

Each of these does seem to help alleviate or eliminate the unfairness of zeros but some might be more difficult than others to implement and actually make effective. Unless your district has a behavioral/effort grade in addition to academic grade, giving a separate behavior grade may be pointless.

Using the median would also be useful but may be hard to calculate on a routine basis. It should not be difficult, though, at the end of a term.

Zeros have never been shown to be an effective way to motivate students. If anything, they have an opposite effect with students given up and shutting down. Zeros are a lead weight around the neck of the grading process. When used, they exaggerate the actually grade for the student in a negative way. I do not believe teachers want to be unfair but the result is unfair. A logical presentation of the mathematics will hopefully improve grading practices.

Another method I would suggest is to demand and provide the resources for students to make up missed work. This might be an afternoon homework club where teachers rotate and stay after school to help students with missed work. It might also be a period set aside during the normal school day for students to make up missed work.

Although never admitted to most teachers, students at-risk DO want teachers to drive them to do what they need to get done. My two-year experience as a Twilight School teacher with the Bensalem Township School District allowed me to work with students at a very high-risk of dropping out of school. My year-end survey to students of the course showed feedback that included many of them stating that they definitely would have dropped out if it were not for the Twilight program. They made statements to the effect that they needed to do the work and appreciated the efforts put forth by their teachers to assure than the work was done.
CONCLUSION

The educational system in the United States is dependent on reliable methods to track student progress. The parents demand it, the administrators demand it, and the government demands it. The ever-changing field of accountability is currently set on high-stakes testing of the academic standards.

Teachers must use a reliable method to evaluate their students. It must be effective and justifiable. A zero is not a fair appraisal of a student’s ability, but instead shows lack of responsibility or resources to complete assignments which is not the purpose of academic grading.

Zeros on a 100-point grading scale have the exaggerated effect of killing motivation. On the outside, zeros seem perfectly fair. No work, no grade. Unfortunately, upon closer examination, the actual mathematics is skewed in a disadvantageous way against the student.

Most teachers became teachers because they care about students and want to help them succeed. Zeros do not help students succeed. Indeed, zeros are needed in the grading system, just in a fair way.

We as teachers need to step up and not let the pink elephant stand in the corner any longer. Do the math. It should take little to convince you that alternative methods must be employed to have a fair method of evaluating students.
References


