Should Learning Be Its Own Reward?

Daniel T. Willingham

How does the mind work—and especially how does it learn? Teachers’ instructional decisions are based on a mix of theories learned in teacher education, trial and error, and knowledge, and gut instinct. Such gut knowledge often serves us well, but is there anything steadier to rely on?

Cognitive science is an interdisciplinary field of researchers from psychology, neuroscience, linguistics, philosophy, computer science, and anthropology who seek to understand the mind. In this regular American Educator column, we consider findings from this field that are strong and clear enough to merit classroom application.

Question: In recent months, there’s been a big uproar about students being paid to take standardized tests—and being paid even more if they do well. Can cognitive science shed any light on this debate? Is it harmful to students to reward them like this? What about more typical rewards like a piece of candy or five extra minutes of recess?

There has been much debate recently about boosting standardized test scores by paying students. Here are a few examples that I read about in the news. In Coshocton, Ohio, third- and sixth-graders are being paid up to $20 for earning high scores on standardized tests. In New York City, fourth-grade students will receive $5 for each standardized test they take throughout the year, and up to $25 for each perfect score. Seventh-graders will get twice those amounts. In Tucson, Ariz., high school juniors selected from low-income areas will be paid up to $25 each week for attendance. These and similar programs affect just a tiny fraction of students nationwide. But rewarding students with things like small gifts, extra recess time, stickers, certificates, class parties and the like is actually pretty common. Most teachers have the option of distributing rewards in the classroom, and many do. For example, in a recent survey of young adults, 70 percent said that their elementary school teachers had used candy as a reward (Davis, Winsler, and Middleton, 2006).

So whether or not your district offers cash rewards for standardized test scores or attendance, you’ve probably wondered if rewarding your student for their classwork is a good idea. Some authors promise doom if a teacher rewards students, with the predicted negative effects ranging from unmotivated pupils to a teacher’s moral bankruptcy (e.g., Kohn, 1993). Others counter that rewards are harmless or even helpful (e.g., Cameron, Banko, and Pierce, 2001; Chance, 1993). Where does the truth lie? In the middle. There is some merit to the arguments on both sides. Concrete rewards can motivate students to attend class, to behave well, or to produce better work. But if you are not careful in choosing what you reward, they can prompt students to produce shoddy work—and worse, they can cause students to actually like school subjects less.

The important guidelines are these: Don’t use rewards unless you have to, use rewards for a specific reason, and use them for a limited time. Let’s take a look at the research behind these guidelines.

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Do Rewards Work?

Rewarding students is, from one perspective, an obvious idea. People do things because they find them rewarding, the reasoning goes, so if students don’t find school naturally rewarding (that is, interesting and fun), make it rewarding by offering them something they do like, be it candy or cash.

In this simple sense, rewards usually work. If you offer students an appealing reward, the targeted behavior will generally increase (for reviews, see O’Leary and Drabman, 1971; Deci, Koestner, and Ryan, 1999). Teachers typically use rewards like candy, stickers, small prizes, or extra recess time. They use them to encourage student behaviors such as completing assignments, producing good work, and so on. In one example
(Hendy, Williams, and Carinse, 2005) first, second, and fourth-graders were observed in the school cafeteria to see how often they ate fruits and vegetables. Once this baseline measure was taken, they were rewarded for eating one or the other. Students received a token for each day that they ate the assigned food, and tokens could be redeemed for small prizes at the end of the week. Not surprisingly, students ate more of what they were rewarded for eating.

But things don’t always go so smoothly. If you mistakenly offer a reward that students don’t care for, you’ll see little result. Or, if you reward the wrong behavior, you’ll see a result you don’t care for. When I was in fourth grade, my class was offered a small prize for each book we read. Many of us quickly developed a love for short books with large print, certainly not the teacher’s intent. In the same way, if you reward people to come up with ideas, but don’t stipulate that they must be good ideas, people will generate lots of ideas in order to gain lots of rewards, but the ideas may not be especially good (Ward, Kogan, and Pankove, 1972). It’s often possible to correct mistakes such as these. Unappealing rewards can be replaced by valued rewards. The target behavior can be changed. My fourth-grade teacher stipulated that books had to be grade-appropriate and of some minimum length.

Because rewards are generally effective, people’s objection to them in the classroom is seldom that they won’t work. The op-ed newspaper articles I have seen about the student payment plans described above don’t claim that you can’t get students to go to school by paying them (e.g., Carlton, 2007; Schwartz, 2003). They raise other objections.

The common arguments against rewards fall into three categories. Let me rate each one in rather extreme terms to give you the idea, and then I’ll consider the merits of each in more detail. The first objection is that using rewards is immoral. You might toss your dog a treat when he shakes hands, but that is no way to treat children. Classrooms should be a caring community in which students help one another, not a circus in which the teacher serves as ringmaster. The second objection is that offering rewards is unrealistic. Rewards can’t last forever, so what happens when they stop? Those who make this argument think it’s better to help students appreciate the subtle, but real rewards that the world offers for things like hard work and politeness. After all, adults don’t expect that someone will toss them a candy bar every time they listen politely, push their chair under a table, or complete a report on time. The third objection is that offering rewards can actually decrease motivation. Cognitive science has found that this is true, but only under certain conditions. For example, if you initially enjoy reading and I reward you for each book you finish, the rewards will make you like reading less. Below, I’ll explain how and why that happens. Let’s consider each of these arguments in turn.

Are Rewards Immoral?

Don’t rewards control students? Aren’t rewards dehumanizing? Wouldn’t it be better to create a classroom atmosphere in which students wanted to learn, rather than one in which they reluctantly slogged through assignments, doing the minimal work they thought would still earn the promised reward? Cognitive science cannot answer moral questions. They are outside its purview. But cognitive science can provide some factual background that may help teachers as they consider these questions.

It is absolutely the case that trying to control students is destructive to their motivation and their performance. People like autonomy, and using rewards to control people definitely reduces motivation. Even if the task is one students generally like, if they sense that you’re trying to coerce them, they will be less likely to do it (e.g., Ryan, Mims, and Koestner, 1983). It is worth pointing out, however, that rewards themselves are not inherently controlling. If students are truly offered a choice—to do this and get a reward, don’t do it and get no reward—then the student maintains control. Within behavioral science, it is accepted that rewards themselves are coercive if they are excessive (e.g., National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978). In other words, if I offer you $200 to take a brief survey, it’s hard to know that you’re freely choosing to take the survey.

Rewards in classrooms are typically not excessive, and so are not, themselves, controlling. Rather, rewards might be an occasion for control if the teacher makes it quite clear that the student is expected to do the required work and collect his or her reward. That is, the teacher uses social coercion. So too, we’ve all known people we would call “manipulative,” and those people seldom manipulate us via rewards. They use social means. In sum, the caution against controlling students is well-founded, but rewards are not inherently controlling.

Are rewards dehumanizing? Again, it seems to me that the answer depends on how the student construes the reward. If a teacher dangles stickers before students like fish before a seal, most observers will likely wince. But if a teacher emphasizes that rewards are a gesture of appreciation for a job well done, that probably wouldn’t appear dehumanizing to most observers. Even so, rather than offer rewards, shouldn’t teachers create classrooms in which students love learning? It is difficult not to respond to this objection by saying “Well, duh.” I can’t imagine there are many teachers who would rather give out candy than have a classroom full of students who are naturally interested and eager to learn. The question to ask is not “Why would you use rewards instead of making the material interesting?” Rather, it is “After you’ve wracked your brain for a way to make the material interesting for students and you still can’t do it, then what?” Sanctimonious advice on the evils of rewards won’t get chronically failing students to have one more go at learning to read. I think it unwise to discourage teachers from using any techniques in the absolute; rather, teachers need to know what research says about the benefits and drawbacks of the techniques, so that they can draw their own conclusions about whether and when to use them. Considering the merits of the two other objections will get us further into that research.
What Happens When Rewards Stop?

This objection is easy to appreciate. If I’m working math prob- lem: because you’re paying me, what’s going to happen once you stop paying me? Your intuition probably tells you that I will stop doing problems, and you’re right. In the fruits and vegeta-

bles study described earlier, students stopped eating fruits and vegetables soon after the reward program stopped.

Although it might seem obvious that this would happen, psy-
chologists initially thought that there was a way around this prob-
lem. Many studies were conducted during the 1960s using token economies. A token economy is a system by which rewards are administered in an effort to change behavior. There are many variants but the basic idea is that every time the student exhib-
tis a targeted behavior (e.g., gets ready to work quickly in the
morning), he or she gets a token (e.g., a plastic chip). Students accumulate tokens and later trade them for rewards (e.g., small prizes). Token economies have some positive effects, and have been used not only in classrooms, but in clinical settings (e.g., Dickerson, Tenhula, and Green-Yades, 2005).

When the idea of a token economy was developed, the plan was that the rewards would be phased out. Once the desired behavior was occurring frequently, you would not give the reward every time, but give it randomly, averaging 75 percent of the time, then 50 percent of the time, and so on. Thus, the stu-
dent would slowly learn to do the behavior without the external reward. That works with animals, but not with humans. Once the rewards stop, people go back to behaving as they did before (Kazdin, 1982; O’Leary and Dabrowski, 1971).

Well, one might counter, it may be true that students won’t spontaneously work math problems once they stop reward-
ing them, but at least they will have worked more than they otherwise would have! Unfortunately, there is another, more insidious consequence of rewards that we need to consider: Under certain circumstances, they can actually decrease motivation.

How Can Rewards Decrease Motivation?

The previous section made it sound like rewards boost desired behavior so long as they are present, and when they are removed behavior falls back to where it started. That’s true sometimes, but not always. If the task is one that students like, rewards will, as usual, make it more likely they’ll do the task. But after the rewards stop, students will actually perform the previously lik-

as(A) task less than they did when rewards were first offered.

A classic study on this phenomenon (Lepper, Greene, and Nisbett, 1973) provides a good illustration. Children (aged 3 to 5 years old) were surreptitiously observed in a classroom with lots of different toys that weren’t available. The experimenters noted how much time each child spent drawing with markers. The markers were then unavailable to students for two weeks. At the end of the two weeks, students were broken into three groups. Each student in the first group was taken to a separate room and given a toy called an “imaginary Player” certificate by drawing a picture with the markers. Each was eager to get the certificate and drew a picture. One-by-one, students in a second group were also brought to a separate room, encouraged to draw, and then given a certificate, but the certifi-
cate came as a surprise; when they started drawing, they didn’t know that they would get the certificate. A third group of stu-
dents served as a control group. They had been observed in the first session, but didn’t draw or get a certificate in this second session. After another delay of about two weeks, the markers again appeared in the classroom, and experimenters observed how much children used them. The students in the first group— those who were promised the certificate for drawing—used the markers about half as much as students in the other two groups. Promising and then giving a reward made children like the markers less. But giving the reward as a surprise (as with the second group of students) had no effect.

This has been replicated scores of times with students of different ages, using different types of rewards, and in realis-
tic classroom situations (see Deci et al., 1999 for a review). What is going on? How can giving a reward reduce your motivation to do something? The answer: lies in the students’ interpretation of why they chose to use the markers. For stu-
dents who didn’t get a reward or who didn’t expect a reward, it’s obvious that they weren’t drawing for the sake of the reward; they drew pictures because they liked drawing. But for the children who were promised a reward, the rea-
son is less clear. A student might not remember that he drew because he wanted to draw, but rather he remembered really wanting the certificate. So when the markers were available again but no certificate was promised, the student may well have thought “I drew because I wanted that certificate; why should I draw now for nothing?”

The analogy to the classroom is clear. Teachers seek to cre-
te lifelong learners. We don’t just want children to read, we want children to learn to love reading. So if, in an effort to get children to read more, we promise to reward them for doing so, we might actually make them like reading less! They will read more in order to get the pasta party or the stickers, but once the teacher is no longer there to give out the rewards, they will say “Why should I read? I’m not getting anything for it.”

The key factor to keep in mind is that rewards only decrease motivation for tasks that students initially like. If the task is dull, motivation might drop back down to its original level once the rewards stop, but it will not drop below its original level. Why
do the appeal of the task make a difference? As I mentioned, rewards butt motivation because of the way students construe the situation: "I drew with markers in order to get a certificate," instead of "I drew with markers because I like to draw with markers." But if the task is dull, students won't make that mis- taken interpretation. They never liked the task in the first place.

That hypothesis has been confirmed in a number of studies showing that once the reward is no longer being offered, having received a reward in the past bars the motivation for an inter- esting task, but not for a dull task (e.g., Daniel and Esser, 1980; Lovelland and Olley, 1979; Newman and Layton, 1984).

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This finding might make one wonder whether rewards, in the form of grades, are behind students' lack of interest in schoolwork; by issuing grades, we're making students like school less (Kohn, 1993). It is true that students like school less and less as they get older. But it is wise to remember that motivation is a product of many factors. Researchers often dis- tinguish between extrinsic motivators (e.g., concrete rewards or grades that are external to you) and intrinsic motivators (things that are internal to you such as your interest in a task). The effect described above can be succinctly summarized: Extrinsic rewards can decrease intrinsic motivation. We would thus expect that intrinsic and extrinsic motivation would be negatively cor- related. That is, if you work mostly for the sake of getting good grades and other rewards, then you aren't very intrinsically motivated, and if you are highly intrinsically motivated, that must mean you don't care much about rewards. That's true to some extent, but the relationship is far from perfect. College stu- dents whose intrinsic and extrinsic motivation have been mea- sured usually show a modest negative correlation, around -.25 (Lepper, Corpus, and Iyengar, 2005). This seems reasonable since motivation is actually pretty complex—we rarely do things for just one reason.

What Makes Rewards More or Less Effective?

If you decide to use rewards in the classroom, how can you maximize the chances that they will work? Three principles are especially important: Rewards should be desirable, certain, and prompt.

The importance of desirability is obvious. People will work for rewards that appeal to them, and will work less hard or not at all for rewards that are not appealing. That is self-evident, and teachers likely know which rewards would appeal to their students and which would mean little to them.

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Less obvious is the importance of the certainty of a reward, by which I mean the probability that a student will get a reward if he or she attempts to do the target behavior. What if you've set a target that seems too difficult to the student, and he won't even try? Or what if the target seems achievable to the stu- dent, he makes an attempt and does his best, but still fails? Either reduces the likelihood that the student will try again. Both problems can be avoided if the reward is contingent on the student trying his best, and not on what he achieves. But that has its drawbacks, as well. It means that you must make a judgment call as to whether he tried his best. (And you must make that judgment separately for each student.) It is all too likely that some students will have an inflated view of their efforts, and your differing assessment will lead to mistrust. Ide- ally, the teacher will select specific behaviors for each student as targets, with the target timed to each student's current level of ability.

A corollary of rewards being desirable is that they be prompt. A reward that is delayed has less appeal than the same reward delivered immediately. For example, suppose I gave you this choice: "You can have $10 tomorrow, or $5 a week from tomorrow." You'd take the $10 tomorrow, right? Rewards have more "oomph"—that is, more power to motivate—when you are going to get them soon. That's why, when my wife calls me from the grocery store, it's easy for me to say "Don't buy ice cream. I'm trying to lose weight." But when I'm at home it's difficult for me to resist ice cream that's in the freezer. In the first situation, I'm denying myself ice cream sometime in the distant future, but in the second I would be denying myself ice cream right at that moment. The promise of ice cream two minutes from now has higher value for me than the promise of ice cream hours from now.

It is possible to measure how much more desirable a reward is when given sooner rather than later. In one type of experi- ment, subjects participate in an auction and offer sealed bids for money that will be delivered to them later. Thus, each sub- ject might be asked "What is the maximum you would pay right now for a reward of $10, to be delivered tomorrow?" Subjects are asked to make bids for a variety of rewards to be delivered at delays varying from one to 30 days. Then, researchers use subjects' bids to derive a relationship between the amount of time that the reward is delayed and how much people value the delayed reward. Subjects typically show a steep drop off in how much they value the reward—with a one-day delay, $20 is worth about $18 to most subjects, and with a one-week delay, the value is more like $15 (e.g., Kirby, 1997). In other words, there is a significant cost to the reward value for even a brief delay. Other studies show that the cost
What is the Difference between Rewards and Praise?

You may have noticed that I have limited my discussion to the effects of explicit rewards—candy, coins, check marks, or tokens. Isn’t praise a reward as well? It can be, but praise as it is usually administered has some important differences. The most important is that praise is usually given unpredictably. The student doesn’t think to himself, “If I get 90 percent or better on this spelling test, the teacher will say ‘Good job, Dan!’” Rewards are different. There is a direct, explicit connection in the classroom, in which the understanding that a particular behavior (e.g., 90 percent on a spelling test) merits a reward. As described in the main article, the decrease in motivation for a task only occurs if the reward was expected (and if the students enjoy the task). Since praise is not expected, it does not lead to an immediate decrement to motivation.

Another important difference between praise and concrete rewards is that the former is often taken as a more personal comment on one’s abilities. Rewards typically don’t impart information to the student. But praise can carry quite a bit of meaning. For starters, it tells the student that she did something noteworthy enough to merit praise. Then, too, the student learns what the teacher considers important by listening to what she praises. A student may be told that she’s smart, or that she tried hard, or that she’s improving. In the short run, sincere praise will provide a boost to motivation (Deci et al., 1999), but in the long run, the content of praise can have quite different effects on the students’ self-concept and on future efforts (e.g., Henderlong and Lepper, 2002; Mueller and Dweck, 1998). The key is in what type of praise is given. When faced with a difficult task, a child who has been praised in the past for her effort is likely to believe that intelligence increases as knowledge increases and, therefore, will work harder and seek more experiences from which she can learn. In contrast, a student who has been praised for her ability will likely believe that intelligence is fixed (e.g., is genetically determined) and will seek to maintain the “intelligent” label by trying to look good, even if that means sticking to easy tasks rather than more challenging tasks from which more can be learned.

A final difference between praise and rewards lies in students’ expectations of encountering either in school. At least in the U.S., praise is part of everyday social interaction. If someone displays unusual skill or determination or kindness, or any other attribute that we esteem, it is not unusual to offer praise. In fact, a teacher who never praised her students might strike them as cold, or uncaring. No such expectation exists for rewards, however. It is hard to imagine teaching students without ever praising them. It is easy to imagine teaching students without ever offering them a concrete reward.


—D.W.
Use Rewards for a Specific Reason
A wise investor understands that taking out a loan, although it incurs a cost, might be strategic in the long run. So too, although a rewards program may incur some cost to motivation, there are times when the cost might be worth it. One example is when students must learn or practice a task that is rather dull, but that, once mastered, leads to opportunities for greater interest and motivation. For example, learning the mass times tables might be dull, but if students can get over that hump of boredom, they are ready to take on more interesting work. Rewards might also be useful when a student has lost confidence in himself to the point that he is no longer willing to try. If he’ll attempt academic work to gain a desirable extrinsic reward and succeeds, his perception of himself and his abilities may change from self-doubt to recognition that he is capable of academic work (Greene and Lett, 1974). Thereafter, the student may be motivated by his sense of accomplishment and his expectation that he will continue to do well.

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Use Rewards for a Limited Time
No one wants to live with chronic debt, and no one should make rewards a long-term habit. Although the cost of using rewards may not be large, that cost likely increases as rewards are used for a longer time. In addition, there would seem to be an advantage to the program having a natural ending point. For example, students are rewarded for learning their times tables, and once they are learned, the rewards end. The advantage is that any decrease in motivation might stick to the task. In other words, students will think “times tables are boring, and we need to be rewarded to learn them” rather than “math is boring, and we need to be rewarded to learn it.” In addition, if students are told at the start of the program when it will end, there may be fewer complaints when the goodies are no longer available.

Notes
1. Such positive framing of rewards does not reverse the negative impact of rewards on motivation, but telling students that rewards signal acknowledgement of good work, rather than the closing of a bargain, seems more in keeping with the spirit of positive psychology.
2. Readers who are familiar with interventions to reduce students’ aggressive or antisocial behavior may be surprised at this finding. Such interventions do often use rewards and then phase them out. But keep in mind that the rewards are just one part of a complex intervention and that in order to be effective, such interventions must be implemented in full. To learn more about the use of rewards in such an intervention, see “Heading Off Disruption: How Early Intervention Can Reduce Defiant Behavior—and Win Back Teaching Time,” American Educator Winter 2003-2004, available at www.aft.org/pubs-reports/american_educator/winter03-04/index.html.
3. A correlation of zero would indicate that they were unrelated, and a correlation of -1.0 would indicate that they were perfectly related.
4. There are exceptions to this generalization, notably in the social realm. People will work hard without reward as part of a social transaction. In such situations a small reward will actually make people less likely to work (e.g., Heyman and Ariely, 2004). For example, if an acquaintance asks you to help her move a sofa, you would assume that she’s asking a favor as a friend, and you might well help. But if she offers you $5 to move the sofa you think of the request as a business transaction, and $5 may not seem like enough money. These social concerns could apply to a classroom; some students might work to please the teacher. But such social transactions may not be so onerous for you if your friend with the poorly placed sofa never helps you out, you will get tired of being asked. It would be difficult to set up a relationship that used social reciprocity between teachers and students.
5. The procedure is actually what researchers call a second-hurdle auction; the highest bidder wins the auction, but pays the price of the second highest bid. This procedure is meant to ensure that people bid exactly what the item is worth to them. The workings of the auction are explained in detail in subjects.

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