

The Costs of Dropping Out of School in Iowa

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Introduction

About a decade ago, in the midst of mounting criticism of public schools from the business community and others and a rising dropout rate in Iowa, Dr. Ray Morley of the Iowa Department of Education requested my services in conducting a research project to investigate (1) the costs of dropping out of school and (2) the productivity benefits of returning and graduating from an alternative school. Alternative schools provide a mechanism for ameliorating the dropout problem in that dropouts could drop back into an alternative school and, hopefully, eventually graduate. We wanted to determine the extent to which alternative schools were producing graduates who were becoming productive citizens and workers.

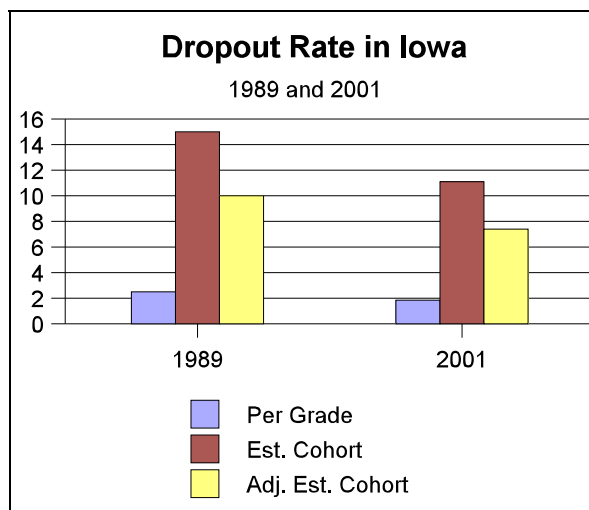


Figure 1: Dropout rates in Iowa for 1989 and 2001.

This report is an update of the first part of the aforementioned research study—the costs of dropping out of school. The dropout rate in Iowa has been reduced and stabilized over the past several years.¹ (See Figure 1.) However, the costs of dropping have, in some cases, increased. Moreover, the number of “at-risk” students—those who may dropout, not successfully complete a course of study, or not become a productive citizen or worker—has increased (Dr. Ray Morley, personal communication, 2002).

Costs of Dropping Out of School

The costs—to society, business, and the individual—of dropping out of school are many and varied. These costs include behavioral and human qualities as well as economic variables such as income, revenue, public assistance, and penal system involvement. More specifically, five factors which were considered in the 1990 report (Veale, 1990) are the following:

1. The reduction in personal income and loss in state revenue;
2. The increase in the welfare burden due to higher unemployment rates (among dropouts);
3. Increased risk of incarceration;

¹ In the figure, the “estimated cohort” rate is the estimated dropout rate for all six grades 7-12 ($= 6 \times$ per grade rate). The “adjusted estimated cohort” is the estimated cohort rate adjusted for those expected to return and graduate ($= (2/3) \times$ cohort rate).

4. Deceleration in human growth and potential;
5. Reduced sense of control over one's life.

The first three of these are *quantitative* and numeric estimates of the amount of such costs are provided; the last two of these are *qualitative* and descriptive assessments are presented. We updated these estimates/assessments using the most current data available at mid-year 2002.

Cost Factor 1: The Reduction in Personal Income and Loss in State Revenue

The research literature provides estimates of the personal income sacrificed (in part) by dropping out of school. Nationally, according to data from the Bureau of the Census, the mean income for non-graduates (dropouts) in 2000 was \$20,748.10, while that of graduates is \$38,068.93. This yields an average ratio of dropout to graduate income of 0.54503, or approximately 0.545. In 1989, this ratio was estimated to be 0.636. Thus, dropouts sacrificed nearly half of their personal income in 2000. In 1989, they sacrificed only a little over one-third of their income. This change may be attributed, at least in part, to the need for more highly educated, technically skilled workers in the increasingly global economy.

The average yearly income in the state of Iowa in 2000 was \$26,376, according to the most recent data available (Source: Department of Revenue and Finance, State of Iowa, 2002). Applying the dropout/graduate income ratio to this figure, one obtains $(.54503)(\$26,376)$ or \$14,376—the estimated average income of dropouts in the state of Iowa in 2000.

Assuming a 45 year working lifetime for the dropouts and graduates, this yields an estimated loss in personal lifetime income of

$$(45) (\$26,376 - \$14,376)$$

or about \$540,000.

The following interpretation of the above result was provided by Del Holland of Metro High School in Cedar Rapids:

Students take about 5 course-hours per year, which yields 5×180 days or about 900 hours of school per year. This translates to about 4×900 or 3,600 hours for the four years of high school. Dividing the loss in lifetime income (\$540,000) by 3,600 hours yields \$150/hour. This amount (\$150/hour) may be contrasted with a \$5-6 per hour wage for a typical high school student's job that, while often beneficial and sometimes necessary, can also serve as an excuse for the student to skip class. Absenteeism can lead to dropping out of school and the aforementioned loss in lifetime income at the rate of \$150/hr, for the gain of only \$5-6/hr from the high school job.

The taxable income for a gross income of \$14,376 in Iowa is estimated to be about 76% of the gross or \$10,926 (Bob Rogers, Department of Revenue and Finance, personal communication, 2002). This yields an estimated state tax of about \$359. The average state tax paid in Iowa in 2000 was \$924 (per individual). The loss to the state treasury which could be attributed to the reduced revenue payments of all 4,220 dropouts in Iowa in 2000-01, is therefore

$$(4,220) (\$924 - \$359)$$

or \$2,384,300. Over the working lifetime (about 45 years) of the average dropout and graduate, this loss to the state treasury becomes

$$(45) (\$2,384,300)$$

or \$107,293,500—about 107.3 million dollars.²

This figure may be viewed as an “opportunity cost”—the amount of potential increase to the state treasury if all dropouts were educated to high school completion. This revenue enhancement would not come without a price tag. The state cost to educate a pupil for the 2000-01 year was \$4,338 (Sue McCurdy, Iowa Department of Education, personal communication, 2002). Based on dropout figures for the state of Iowa, broken down by grade level (year the person dropped out), the average dropout in 2000-01 would need about 2.22 years of additional schooling to graduate. Using these figures, the estimated total cost to educate all 4,220 dropouts in Iowa in 2000-01 to high school completion is

$$(4,220) (2.22) (\$4,338)$$

or \$40,640,119—about 40.6 million dollars. This would be a “one time” cost to the state for these dropouts.

The potential net increase to the state treasury, accumulated over the lifetime of the dropout-turned-graduate would therefore be the difference between the \$107.3 million opportunity cost and the \$40.6 million total state cost for educating the dropouts—about *66.7 million dollars*. This estimated net increase to the state treasury in 2000 dollars is the net gain due to educating all of the previous year’s dropouts to high school completion. This amount would be accumulated over the working lifetimes of the dropouts-turned-graduates. This works out to be about 1.48 million dollars per year.

On the other hand, it is probably overly optimistic to assume that any program to educate all such dropouts to high school completion would be 100% successful. However, even if it were only 50% successful, this would result in a net gain for the state treasury. Moreover, it would surely result in other types of savings, such as reduced welfare dependency, reduction in number and severity of crimes, as well as gains in revenue from increased productivity. (See Cost Factors 2,3, and 5.)

Cost Factor 2: The Increase in the Welfare Burden

The second type of cost factor is that of the increased welfare burden due to dropping out of school. Though state statistics are not available on unemployment levels for dropouts, national statistics tell us that dropouts have an unemployment rate just under twice the overall rate (U.S. Department of Labor). Specifically, the rate for dropouts in 2001 was 7.3%, while the overall rate was 3.7%, yielding a dropout-to-overall unemployment rate ratio of 1.97. Iowa’s (overall) unemployment rate averaged about 3.35% during the first two months of 2002 (Iowa Department of Workforce Development). Assuming the national unemployment ratio of 1.97 holds in Iowa, the dropout unemployment rate was estimated to be 6.60% (= (1.97)(3.35%)).

The estimated welfare payment (including those from the Family Investment Program, Food Stamps, and Medicaid) for January 2002 was about \$800 according to the Iowa Department of Human Services. The estimated cost of increased welfare payments for the 4,220 dropouts in 2001-02 is:

² It may be argued that not all of the above loss in personal income (\$540,000) and state revenue (\$107.3 million) is due to the educational status of the individuals concerned, namely that of “dropout.” It may be due to other factors such as ability, socioeconomic status, race, etc. Regarding ability, educating dropouts to high school completion should improve their ability or skill level. The effects of SES and race may be more difficult to overcome—due to bias and discrimination which still exist to some degree. However, the \$924 average state tax payment for Iowans in 2000 includes payments made by dropouts as well as graduates. This figure would surely be higher if only graduates were included. Hence, the above figure for loss in state revenue might actually be conservative.

(4,220) (.0660 - .0335) (\$800) (12)

or \$1,316,640—about *1.3 million dollars* per year. This assumes that unemployed dropouts are receiving some form of public assistance which averages \$800 (the state overall average).

If, in addition, it is assumed that educating all dropouts to high school completion would result in a reduction in the unemployment rate to that of the general population of Iowa in 2002, the above cost figure can be converted to a savings for the State of Iowa—and the Iowa taxpayers. Thus, it is estimated that about 1.3 million dollars could be channeled into other programs, e.g., dropout prevention, or into deficit reduction.³ It may be noted that this figure is somewhat less than the estimate in 1990 (2.4 million dollars). This may be attributed to the reduction in the number of dropouts, the reduction in the unemployment rates, and the changes in the welfare system over this period (Veale, 1990).⁴

Cost Factor 3: Increased Risk of Incarceration

Dropouts are more likely than graduates to be in trouble with the authorities. The tenth most popular reason for dropping out of school, given by those who were motivated to return to an alternative school, was that “discipline and punishment were unfair to me” (Morley, 1989). About 43% of the dropouts who return to an alternative school in Iowa were apparently involved in disciplinary actions (which they felt were unfair) prior to dropping out of school (*ibid.*). The percentage for dropouts who do not return to school might be assumed to be as high or higher.

Such interactions with school authorities are indicative of a propensity for behavior which may later lead to incarceration. In Iowa in January of 2002, there were 1,493 inmates in adult corrections facilities with less than a high school education, out of a total of 3,818, excluding those with GEDs (3,793) and whose educational level was unknown (323) (Source: Iowa Department of Corrections). Thus, the proportion of inmates who are dropouts out of the total number whose educational level is known (excluding GEDs) is

$$1,493/3,818$$

or 0.391.

By Bayes’ Rule for inverting conditional probabilities, assuming the estimated cohort dropout rate for the general population, it may be shown that the increased risk of incarceration among dropouts over that of the general population is equal to the odds of having dropped out of school among the incarcerated population divided by the odds of dropping out among the general population. This may be shown to be equal to:

$$\frac{(.391)/(.609)}{(.111)/(.889)}$$

or 5.14. This follows by Bayes’ theorem from probability theory (e.g., Kazmier and Pohl, 1984).

³ This estimate is also probably somewhat optimistic, since it assumes the dropout education program to be 100% successful. A program which is only 50% successful would save the state about \$658,000 per year. On the other hand, the actual unemployment rate for dropouts in Iowa may be greater than 6.6% and the average payout to dropouts may exceed that of the population at large (\$800). Thus, the savings could be even greater than those estimated in the above calculations.

⁴ Specifically, the number of dropouts was reduced from 5,652 in 1989 to 4,220 in 2001, while the unemployment rate was about 4.5% in 1990 compared with 3.35% in 2002. The estimated welfare payment for 2002 is only \$5 higher than that of 1990.

Thus, *dropouts are about 5.1 times as likely to become incarcerated as graduates*. This assumes that the probability of a randomly selected student in grades 7-12 in Iowa becoming a dropout is 0.111, i.e., about 11% of 7th grade students in Iowa drop out before completing high school. This is the *cohort* dropout rate—the proportion of a cohort group dropping out of school sometime during the 6 year school period. (This was estimated by multiplying the annual dropout rate of 1.85% by 6.) A risk of 5.1 may be compared with the risk of developing lung cancer from smoking cigarettes or the risk of contracting AIDS from having unprotected sexual intercourse with someone whose HIV status you do not know—both, reportedly, around 10 times that of individuals who do not engage in those activities.

The cohort dropout rate may be somewhat inflated due to students' re-entering after dropping out the previous year. A fairly liberal estimate of this adjustment is 1/3 of the cohort, which brings the dropout rate down to 7.4% (Raymond Morley, personal communication, 2002). Using this adjusted cohort rate, i.e., $P(\text{dropout}) = 0.074$, the relative risk of a dropout becoming incarcerated becomes 8.03, which is even greater than the previous estimate.⁵

The above statistics on incarceration are critical to any analysis of cost of dropping out of school. The average cost of keeping a person incarcerated for one year in Iowa in 2002 is \$22,977 (Source: Iowa Department of Corrections, 2002). In contrast, according to the Iowa Department of Education, the state cost to educate a student for one year is presently \$4,338. Educating a dropout the estimated average of 2.22 years to high school completion would cost \$9,630—a little over 40% of the cost of incarceration of a prisoner for one year. Of course, the cost of incarceration doesn't include court costs, damage to property, loss in productivity, increase in insurance rates, loss of human life, incapacitation, and/or hospital costs for the victim due to the criminal act. Levin (1972) estimated that as much as 25% of all costs associated with criminal activity could be attributed to undereducation (not completing a high school education).

Cost Factor 4: Deceleration in Human Growth and Potential

The costs in terms of human growth and potential of dropouts include the following:

- lower cognitive skill level
- reduced options to economic progress
- restricted social network
- poorer health (more likely to have unhealthy behaviors; less likely to have healthy ones)

Many dropouts cannot read a map or perform calculations necessary to balance a checkbook (National Center for Educational Statistics, 1987). They have fewer options to programs which promote economic progress. For example, postsecondary educational institutions and the military both require a high school diploma or equivalency (GED).

In 1999, U.S. organizations with 100 or more employees spent 62.5 million dollars on training ("Industry Report," 1999). However, this centers on learning for managers and professionals, with less expended for productivity training for service workers or basic schooling for unskilled workers (Davis and Botkin, 1994). In fact, ASTD research found wide variance in the amount of training workers receive based on occupation, pay, and education level (McMurrer, Van Buren, and Woodwell, 2000).

⁵ GEDs were excluded from these calculations because it wasn't clear just how they should be classified if they were to be included. Some may have obtained their GEDs while they were incarcerated. Moreover, there is no general agreement concerning whether or not the GED is equivalent to a high school diploma. For example, some branches of the U.S. military do not presently accept the GED in place of a diploma.

In a study of over 1,000 full-time employees in 60 organizations in Iowa, researchers found that those with more education spent more time in work-related learning activities. The amount of time employees *preferred* to spend in such activities was also greater for those with more education. In addition, awareness of corporate policies supporting education and training was greater among those with more education (Westbrook and Veale, 2001). Adults with less education thus seem at risk of not having the knowledge and policy awareness needed to advance in learning organizations, further evidence of the “knowledge divide” in our society (Davis and Botkin, 1994).

The dropout’s social network is likely to become restricted to others of similar educational status. The topics of social discourse between dropouts and graduates will naturally become fewer as the educational gap between them widens. Moreover, there is evidence that dropouts exhibit more risky health behaviors. In statewide Youth Risk Behavior Surveys conducted in 1999 and 2001, alternative school students (many of whom had dropped out of traditional schools) had higher percentages indicating negative health risk behaviors such as tobacco, alcohol, and other drug use (Veale, 2000 and 2002a).

Cost Factor 5: Reduced Sense of Control over One’s Life

Dropouts project a more external “locus of control” than do graduates (Wehlage and Rutter in Natriello (Ed.), 1987). In other words, dropouts have a reduced sense of control over conditions which affect their lives. Things happen *to* them which they feel they cannot control. They tend to be more likely to feel that luck is more important than hard work in obtaining success in life.

The implications of this result concerning locus of control are somewhat different than those of human growth and potential. For example, a person with a reduced sense of control over her/his life might be less likely to become involved in the political process. In addition, he/she might be less likely to participate in volunteer activities or to take responsibility and initiative in the work place. A person with less feeling of control over her/his environment will probably be less likely to participate in activities to change that environment. This cost could thus manifest itself in the reduction of an individual’s productivity, as measured by citizenship and volunteerism, as well as performance in the work place. The idea that luck is more important than hard work could lead to problems with gambling addiction via the multiple avenues now available in Iowa for such nonproductive and potentially harmful activities.

Comparison: Costs of Dropping Out in 1990 and 2002

The following table summarizes the results for the quantitative costs of dropping out reported in the 1990 and 2002 studies:

Table 1: *Costs of dropping out in 1990 and 2002*

Cost Factor	1990	2002
1. Loss in personal income over lifetime	\$340,000	\$540,000
Cost to state in reduced revenues per year	\$2.0 million	\$2.4 million
2. Increase in welfare burden	\$2.4 million	\$1.3 million
3. Increased risk of incarceration	5.6	5.1

No attempt was made to adjust for inflation. However, it is clear that the difference in loss in personal income over the lifetime of the dropout cannot be explained by inflation. On the other hand, the increase in the cost to the state in reduced revenues per year over this period may be largely explained by inflation. (The potential net increase to the state treasury per year due to educating all dropouts to high school completion went from about \$1.2 million to \$1.5 million over this period. This could also be largely explained by inflation.) The increase in the welfare burden from higher unemployment among dropouts actually went down over this period, while

the increased risk of incarceration from dropping out of school remained at around 5-6 times that of graduates.

The figures in Table 1 refer to the quantitative costs—factors 1-3 as originally defined. Although we cannot attach a dollar figure to it, cost factor 4 may well have increased in the sense that the importance of cognitive skills and other human growth and development aspects are greater in the global, high tech economy of today. Cost factor 5 could also have increased in the sense that an external locus of control could lead to costs associated with the increased opportunity for gambling in our state, increased risk for disease (e.g., HIV/AIDS), and non-involvement in (1) training opportunities to improve productivity in the work place and (2) civic and political activities to improve the social and physical environment.

Conclusions and Considerations for the Future

In all, these five costs of failing to educate our youth to high school completion (and hopefully, beyond high school) provide a compelling case for social innovation. These costs can be turned into savings or gains in state revenues, with appropriate and effective social programs. If viewed over the lifetime of the student, these savings may be quite impressive—both in quantitative and human terms. Examples of social and educational innovations that have been introduced or expanded in Iowa during the past decade that have contributed to the reduction in the dropout and unemployment rates over this period include:

- Dropout prevention programs in 237 school districts supported via Iowa Code 257.38-41, providing a variety of initiatives to keep students in school including before and after school programs, school-based services, and alternative education;
- the School-Based Youth Services Program(s) supported by state grants from 1990-91 to 2001-02 and currently supported via Iowa Code 257.38-41, collaborative services programs currently in about 25 communities serving pre-K to 12th grade students in the areas of health, mental health, training and employment, recreation, and life skills (Veale, Morley, and Erickson, 2002);
- the Drug and Violence Prevention Program at Woodbury Elementary School in Marshalltown supported by a grant from the Iowa Department of Public Health, providing small group activities and classroom integration in anger control, character development, empathy, social skills, and leadership, as well as community service learning activities (Veale, 2002b);
- 21st Century grants, providing federal resources for funding afterschool and other educational, pro-social activities for children in selected communities;
- nearly 100 alternative schools, GED, and high school completion programs providing a second chance for dropouts and a choice of an alternative approach to education; many of these are associated with community colleges, providing a natural gateway to post-secondary education after graduation;
- Career Education and School-to-Work, educational initiatives designed to provide a sense of purpose to education and to encourage students of all ages to explore interests and what it takes to develop and maintain a rewarding career;
- IJAG (Iowa Jobs for America's Graduates), a Governor's initiative to improve the potential of dropouts and potential dropouts to succeed in employment and thereby improve productivity in communities;
- School improvement initiatives for all school districts (public and private) to assure services for all students; specific emphasis on improving student performance and maximizing potential;

- Federally sponsored Drug-Free Schools initiatives to help schools address substance abuse through education and intervention assistance programs, used by 99% of the school districts in Iowa to assist students in this health concern;
- Career and technical education programs which offer lab and community-based practical application training opportunities, leadership development, and cooperative work experiences.

These examples are not intended to be exhaustive but represent the fact that Iowa is addressing the issue of dropping out at a significant level. We do not know the full impact of these initiatives on the dropout problem. However, many of these fall into the categories of basic core strategies to help solve the school dropout problem identified by the National Dropout Prevention Center at Clemson University (Schargel and Smink, 2001). Moreover, early records of dropouts before such initiatives were introduced in Iowa indicate a dropout rate of over 10%. If this were the case today the (negative) economic impact to the state would be far greater. Therefore, these and other programs and initiatives need to be supported and expanded to further reduce the dropout rate and the costs associated with it.

Web Sites

The following Web sites were useful in collecting data used in this report:

- www.census.gov for data on personal income of dropouts and graduates in U.S.;
- www.bea.gov for data on personal income for a given state;
- www.bls.gov for data on unemployment rates for dropouts and graduates in U.S.;
- www.iowaworkforce.org for unemployment rates (monthly) in Iowa.

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