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HUMAN POWER VEHICLE PROGRAM

Final Report

for Period June 15, 1993 - June 14, 1995

Jack Crowell and Pat Graves

Delta College
University Center, MI 48710

November 1995

Prepared for

THE U.S. DEPARTMENT OF ENERGY
AGREEMENT NO. DE-FG02-93ER79174

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ABSTRACT

The Human Power Vehicle Program was an intensive, five day a week, four week program designed to give middle school students the opportunity to "be engineers".

During the month of July, Delta College, the Macro Michigan Multicultural Pre-Technical Education Partnership (M3PEP), and the United States Department of Energy sponsored a four-week learning experience in human-powered vehicles. This unique experience introduced students to the physiology of exercise, the mechanics of the bicycle, and the physics and mathematics of the bicycle. Students also participated in a three day bike tour.

The Program used the Bike Lab facility at Delta College's International Centre in Saginaw, Michigan. Students had the opportunity to explore the development and refinement of the bicycle design and to investigate it's power machine-the human body. Interactive instruction was conducted in groups to assure that all students experienced the satisfaction of understanding the bicycle.

The purpose of the Program was to increase minority students' awareness and appreciation of mathematics and science. The premise behind the Program was that engineers and scientists are made, not born. The Program was open to all minority youth, grades 8 and 9, and was limited to 25 students. Students were selected to participate based upon their interest, desire, maturity, and attitude.

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NARRATIVE REPORT

Year 1 Overview:

Delta College's Human Power Vehicle Program was conducted during July 1993. The four week Program was held at Delta College's International Centre in Saginaw, Michigan.

The Program consisted of four areas of instruction: mathematics, physics, human physiology of exercise, and bicycle refurbishing and repair. There were four instructors, each responsible for one of the areas of instruction. A typical day would include one and a half hours of instruction in each of the four areas with mathematics and physiology in the morning, and physics and bike refurbishing in the afternoon. Twenty-eight (28) students began the Program and twenty-four (24) students (86%) successfully completed the Program. On the final three days of the Program, thirteen (13) students participated in the "Tour of the Thumb", a bicycle tour of the thumb area of Michigan that was organized and directed by a local bike organization, the Tri-City Cyclist.

The Program went according to plan with little to no deviation from the original proposal. As a result of grant support, ten (10) complete bicycle work stations were made available and a bike lab was implemented where students can repair and refurbish donated bikes throughout the year. Approximately fifty (50) bikes were donated by the community and these bikes were then repaired, refurbished, and donated back to community members.

Participating students evaluated the Program highly, but several students suggested that additional time be given to the refurbishing of the bikes. The use of bicycles to show the applications of mathematics and science worked well, and the refurbishing of bicycles, as

an experience for the students to "play engineer", was a big success. The Project Director (J. Crowell) also evaluated the Program as successful in achieving its goals and objectives.

The student profile was: (Gender: 18 males, 10 females; Ethnicity: 17 African-Americans, 8 Hispanics, 1 Native American, and 2 Caucasians).

Year 2 Overview:

Delta College's Human Power Vehicle Program took place during July 1994. The four week program was held at Delta College's International Centre in downtown Saginaw, Michigan and at the main campus at University Center, Michigan. The Program consisted of four areas of instruction: physics, human physiology of exercise, mathematics, and bicycle refurbishing and repair. There were four instructors, each responsible for one of the areas of instruction, along with one assistant that helped with the bicycle refurbishing and repair. A typical day would include an hour of instruction in each of the areas, with the exception of two hours spent on bicycle refurbishing and repair. Twenty-five (25) students began the Program, and nineteen (19) students (76%) successfully completed the Program. On the final three days of the Program, all nineteen (19) students participated in a "Tour of Delta College". The tour started at the International Centre in Saginaw and participants biked 16 miles to Delta College's main campus at University Center; then participants biked 16 miles to Delta College's Midland Center in Midland, and then participants biked approximately 25 miles back to the International Centre in Saginaw. The tour took three days and the students spent the night at each of the College's centers.

The Program was conducted according to the original proposal with some minor modifications based on the first year's experiences and participant evaluations. During the second year, additional time was spent on bicycle refurbishing and repair, along with a greater emphasis being placed on physical conditioning. Each of the students completely refurbished a bicycle and they all participated and successfully completed the entire bicycle tour. In Year 02, the students were better prepared for the biking component of the Program.

As a result of the grant, ten (10) completed bicycle work stations were made possible. A bike lab exists where students can repair and refurbish donated bikes throughout the year. Over 100 bicycles have been donated by the community and these bikes have been refurbished and recycled back to the community. At Christmas, twenty-two (22) bikes were refurbished and given to a local church to be donated to economically disadvantaged youth in the local community.

The participating students evaluated the Program highly, and their favorite part of the Program was the refurbishing of bicycles. The use of bicycles to show the applications of mathematics and science worked well, and the refurbishing of bicycles, as a "hands-on" experience for the students to "play engineer", was highly successful. As in the first year, the Program Director (J. Crowell) rated the Program highly successful.

The profile of participating students was: (Gender: 18 males, 1 female; Ethnicity: 10 African-Americans, 6 Hispanics, and 3 Caucasian). Nineteen (19) students successfully completed the Program and they each had near perfect attendance.

Overview/Description of Specific Program Components:

Recruitment:

To recruit students, the Program Director (J. Crowell) contacted Saginaw area middle school math and science teachers and asked them to recommend students for Program participation. Each year, twenty-four (24) students were recruited before the end of the school year. The recommended students and their parents were invited to an orientation meeting one week before the Program was scheduled to begin, however, only half of the recommended students attended the orientation. To recruit additional participants, the Saginaw News was asked to assist in the student recruitment process. The Saginaw News published an article that informed the community of the Program and the available openings that existed. As a result of the article and school personnel referring students, the Program began with twenty-four (24) students.

In both years there was a slight attrition of participants, and in each instance the students that did not successfully complete the Program were recruited from the newspaper publicity effort. It appeared that while the students who were recruited by the newspaper article were motivated, they were not as academically talented as those referred directly from school personnel. However, the participants that were recruited from the additional publicity that completed the Program did well and brought an element of diversity to the Program that would not have otherwise existed. The Program Director (J. Crowell) observed that the students recruited through school referrals were strong academically but weak in the mechanics portion of the Program, and the students

recruited by the newspaper appeared to be stronger in the mechanical aspects of the Program.

Academics:

The students participated in three academic subject areas: mathematics, physics, and human physiology and exercise. These subject areas were designed to compliment each other while showing "hands on" applications to the design of the bicycle and to its power source-the human body.

In mathematics, students learned the geometry of the circle, measurement, exponents, angular and linear velocity, basic right triangle trigonometry, beginning vector algebra, and ratios.

Most of the physics that were included in the Program were directly applied to the bicycle. The students were introduced to measurement, distance/time, velocity/acceleration, work/energy, temperature/pressure/volume, mechanical advantage of pulley systems, torque, linear and angular momentum, frictional forces, and ways to measure power output from a bicycle.

The human physiology of exercise was an exciting subject area for participants. The students used their bodies to determine the effect of exercise on: respiration, heart rate, and blood pressure. Also, the students examined the effect of anaerobic and aerobic exercise on their performance on an ergometer and measured their level of fitness using the National Physical Fitness Test.

All students attended class for three hours per day during the Program, with each class session lasting one hour. To assure quality of instruction and individualized attention, class capacity was kept to a maximum of thirteen students.

Bike Lab:

The bike lab was the facility where students rebuilt and refurbished bicycles that had been donated to the Program. There were ten complete workstations consisting of bike stands and tools. Due to the level of supervision and the necessary tools available to rebuild and refurbish the bikes, the Program was structured so that there were no more than twelve (12) students working in the lab at one time. During the first year, the students completely disassembled the bikes and painted the frames before reassembling them (with great difficulty). The amount of supervision required by the students (one instructor) was underestimated due to the painting of the frames and the subsequent effort to assist the students to reassemble the bikes. In the second year, the staff was expanded to include two instructors and two student assistants. The expanded staff, along with removing the painting of the bicycle frame as an objective, worked much better for the students. Most of all, the students enjoyed the bike lab portion of the Program. All students were able to complete one bike which they kept upon successful completion of the Program.

Bike Riding:

Another part of the Program was to assist the participants to improve their physical conditioning. During the first year, students were limited to a physical conditioning class

that was designed to condition the students for a three day bike tour. Very little bicycle riding was done because it took the full month to finish up the reconditioning and refurbishing of the bicycles. Even though the students finished up the month in better physical condition than when they started the Program, their bike riding conditioning left something to be desired.

Based on the experiences of the first year, revisions were made during the second year, and all students rode a bike ten miles a day for the duration of the Program in addition to the conditioning class. This necessitated the students bringing their own bikes to ride or providing them with rideable bikes. In addition to enhancing their conditioning, the daily bike ride also allowed the students to develop safe riding practices. The location of the International Centre was within two miles of a park system which provided a nice network of paths to ride on. Riding through the city to get to the paths gave the students experience in city riding and provided public exposure to the Program. All students actively participated and completed each leg of the three day bike tour at the end of the Program.

Bike Tour:

During the first year, the bike tour extended the conditioning of the students beyond their limited preparation. The bike tour was not mandatory, and of the twenty-three (23) students remaining in the Program, eleven (11) students chose to participate for three days of the eight day "Tour of the Thumb" bike tour, organized by a local bike club, the Tri-City Cyclist.

The second year proved to be better. The Program organized its own bike tour called the "Tour de Delta". Delta College has centers in Saginaw and Midland in addition to the main campus at University Center. The "Tour de Delta" started in Saginaw at the bike lab and went to the main campus at University Center (approximately 16 miles) where the students spent the night. On the second day, the students travelled from the main campus to the Midland Center (approximately 16 miles) where the students again spent the night. On day three, the students biked from Midland back to the International Centre in Saginaw (approximately 25 miles). All of the students participated and finished the "Tour de Delta", making the tour a fitting way to end the Program. In the future, the bike tour will be open to other members of the community and it may be used as a fundraising event to obtain funding to support ongoing Program activities.

Follow Up:

As a result of the grant, a bike lab (an 80 x 40 foot room with tools, bikes, and other bike equipment), is available for year round use. Throughout the year, the lab has been open on Sunday afternoons for students and community members to repair and refurbish bikes. Approximately fifty bikes have been refurbished and donated to the community. A Saturday class in mathematics and bike mechanics was offered at no cost to middle school aged youth. Another class will be offered in the spring for students in the Human Power Vehicle Program target group, and this class will be used as a way of promoting the summer Program component scheduled for July.

Public Relations Materials:

The Program generated four newspaper articles, one journal article and a recruitment video. Copies of all the materials are attached with the exception of the video. A copy of the video has previously been given to the Department of Energy.

Community Involvement:

More than 150 bicycles were donated by members of the community. Local bike shops assisted in donating some older bikes and used parts. Sears Roebuck and Company donated a large number of new and used bike parts and the Dow Chemical Company donated twenty (20) used bikes and twenty (20) bike helmets.

The community was responsive and continues to be very supportive and serves as an indicator of the acceptance of the Program. The Program is a unique way of providing opportunities for young people to become involved in mathematics, science and engineering.

ATTACHMENTS:

Copies of all materials and publications related to this grant are attached. The program generated four newspaper articles, one journal article and a recruitment video. Copies of all materials are attached with the exception of the video, which has already been forwarded to Department of Energy staff.

PATENT CERTIFICATION

Delta College
Contractor

☐ Interim Certification

☒ Final Certification

DE-FG02-93ER79174.A001
DOE Prime and/or Subcontract Nos.

Contractor hereby certifies that: Not Applicable

1. All procedures for identifying and disclosing subject inventions as required by the patent clause of the contract have been followed throughout the reporting period.
2. There were no subcontracts or purchase orders involving research, development, and demonstration except as follows:
3. No inventions or discoveries were made or conceived in the course of or under this contract other than the following (Certification includes ☐, does not include ☐ all subcontracts):

<u>TITLE</u>	<u>INVENTOR</u>	<u>DATE REPORTED</u>	<u>DOE "S" NO.*</u>
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4. The completion date of this contract is as follows:

5. The following period is covered by this certification:

<u>June</u>	<u>15</u>	<u>1993</u>	to	<u>June</u>	<u>14</u>	<u>1995</u>
Month	Day	Year		Month	Day	Year

Delta College
Contractor

X
Signature

Office of Research and Development

Peter D. Boyse, President
Title

University Center, MI 48710
Address

November 27, 1995
Date of Certification

*Also include Subcontract No. if available

SPECIAL RESEARCH GRANT PROPERTY CERTIFICATION

GRANTEE Delta College GRANT NO. DE-FG02-93ER79174.A001

DOE Assistance Rules, 10 CFR 600.123, requires grantees to provide a listing of property furnished by DOE or acquired with DOE grant capital equipment funds prior to grant closeout. In order to facilitate grant closeout, please review your property records and complete the applicable parts of this certificate and return it to the Contracting Officer as soon as possible.

Please complete Item I or II as applicable:

I. There was no reportable residual property of any description at the completion of this grant.

SIGNATURE

TITLE Peter D. Boyse, President

DATE 11/27/95

II. A final inventory of residual property is enclosed for the category (or categories) checked below:

() A. NONEXPENDABLE PERSONAL PROPERTY, Federally-Owned (acquired with Capital Equipment funds, Government furnished-equipment, or through excess)

() B. EXPENDABLE PERSONAL PROPERTY (SUPPLIES), if fair market value exceeds \$1,000.

Except for the category (categories) checked above, no other reportable residual property of any description remained on this grant at its completion.

SIGNATURE

TITLE

DATE

AA-88
02/92

THE HUMAN POWER VEHICLE PROGRAM

July 6-30, 1993

Do something exciting with your summer--learn about yourself and the bicycle.

The Human Power Vehicle Program is from 9 AM - 4 PM, 5 days a week, starting July 6 and ending July 30.

During the month of July, Delta College, Macro Michigan Multicultural Pre-Technical Education Partnership (M³PEP), and The United States Department of Energy are sponsoring a four-week, learning experience in human-powered vehicles. This unique experience will introduce students to the physiology of exercise, the mechanics of the bicycle, the design of human-powered vehicles, and the physics and mathematics of the bicycle, along with the history and the impact of the bicycle on society.

The month-long program will make use of the Human Power Lab facility at the Delta College International Centre in Saginaw. Students will have the opportunity to explore the development and the refinement of the bicycle design and to investigate it's power machine—the human body. Instruction will be in groups, interactive in nature, to insure that all students will experience the joy and the satisfaction in understanding the marvelous human-powered machine—the bicycle.

This exciting program is funded by The United States Department of Energy and developed by Delta College and M³PEP for the purpose of increasing the awareness and the appreciation among minority students for mathematics and science. The major premise of the program is that engineers and scientists are made and not born. The program is open to all minority youth, Grades 8 and 9, and is limited to 25 students. The selection of the students will be based upon interest, desire, maturity, and attitude.

Some of the program highlights . . .

1. Learn to rebuild bicycles.
2. Discover your own personal limitations in exercise.
3. Attend a bicycle race.
4. See the application of physics and mathematics to human-powered vehicles.
5. Design a bicycle.
6. Take part in a 3-day bike tour.
7. Explore designs of other human-powered vehicles—planes, boats, etc.
8. Investigate the relationship between design and human power.
9. Spend three days at a state forest, building and clearing trails.
10. Visit a custom bike shop.
11. Participate in a community project to promote the bicycle.
12. Learn about yourself and have fun.

To Apply

To apply for the Human Power Vehicle Program, fill out the attached application and return to **Jack Crowell, G-209, Delta College, University Center, MI 48710.** The deadline for applying is May 25, 1993.

STATEMENT OF IMPORTANCE: If you are, or have been under medical care for a physical condition which restricts your ability to engage in vigorous exercise or activity, you should consult with your physician and obtain his or her permission to participate in any course. Unless students advise their instructor in writing of such an existing health condition or handicap; by enrolling in the course, students represent that they know of no condition which limits their ability to safely and fully participate in the course. It is expressly understood that students assume all risk of bodily harm resulting from such course activity.

It is the policy of Delta College not to discriminate on the basis of race, color, religion, sex, age, national origin or handicap in its educational programs, activities or employment.

Delta College 1993 Human Power Vehicle Program Application Form

Send To: Jack Crowell, G-209, Delta College, University Center, MI 48710 • Deadline: May 25, 1993

Student's Name _____ Birthdate _____ Sex _____
LAST FIRST MIDDLE INITIAL

Street Address _____ Phone _____

City, State, Zip _____ Grade in Fall 1993 _____

School Attending at the Present Time _____

School Attending Next Fall _____

County of Residence _____ How long? (Years/Months) _____

Parent/Guardian's Name _____ Daytime Phone _____

Address, City, State, Zip _____

Ethnic Origin (Optional. Check only one.)

☐ African American ☐ Asian/Pacific ☐ Caucasian ☐ Hispanic ☐ International ☐ Native American

Write a brief paragraph stating why you would like to attend the **Human Power Vehicle Program** at Delta College. _____

Authorizations/Permission:

STUDENT: Please sign here to indicate your personal commitment to participate in the **Human Power Vehicle Program** at Delta College.

PARENT/LEGAL GUARDIAN: Please sign here to acknowledge your consent for the student's participation in the **Human Power Vehicle Program** at Delta College.

STUDENT'S SIGNATURE

PARENT/GUARDIAN'S SIGNATURE

Fixing bikes a part of learning

Robert D. Doster gears up for summer vacation.

The 14-year-old freshman at Buena Vista High School will wind his way through math, physics and fitness classes at Delta College. Then he will get dirty.

Armed with wrenches, pliers and elbow grease, Doster will peel off broken chains, replace tires, polish spokes and paint bikes donated to the Human Power Vehicle Program at the college's International Centre.

"It shows me how to fix things," Doster says. "After I graduate from college, I want to become a mechanical engineer and work on computers."

This is Doster's second year in the two-year pre-engineering program for minority youths, funded by the U.S. Department of Energy. The \$40,000 grant was awarded to college officials in 1993 for two years, to design a program that will interest eighth- and ninth-graders in careers in math and science.

Students will meet from 9 a.m. to 4 p.m. five days a week beginning Tuesday, July 5. At the end of the four-week program, the youths will participate in a three-day camping-and-bike trip touring the Thumb.

Although the emphasis is on academics, physical fitness and bike building will receive more attention this year, says Jack Crowell, Delta math and computer science professor and coordinator of the program.

Students will participate in an hour-long bike ride every day before class.

"During last year's tour, many students were unprepared to pedal 60 to 70 miles a day," he recalls. "We want to build up to some long rides so they will feel comfortable. They have a lot of energy to burn. It will help the academic portion. They will be able to pay better attention."

"One of the major objectives is to give them a head start in math and science before they get into high school."

The group is limited to 25 youngsters; 15 openings remain. Further information is available by contacting Crowell at 686-9052.

The program also is in the market for used bicycles,

Crowell notes.

Last year's workshop was a shot in the arm to Doster, who holds a 3.8 grade-point average after completing the eighth grade at Ricker Middle School.

It also boosted his interest in mechanics.

In this high-tech era when many people can't figure out how to program a VCR even with the directions, the teen-ager hooked up a pair of video games to one television without the use of a special device and has repaired a telephone answering machine. He also installed screens on all the windows and reconnected the VCR after his mother moved the

entertainment center.

"I had a really good time last summer," he says. "It was one of the best summers I ever had. I'm looking forward to doing it all again."

A single parent, Denise R. Doster is a mother of three children. In addition to her full-time responsibilities as a human resource technician at St. Luke's Hospital, she's involved in her children's activities.

"I make my own comfort level because I look for things for my children to do," she says. "I do know where my kids are."

"It's a fabulous program. I like the exposure he gets to college and to physics since he's so interested in science."

Denise Doster encourages her children to participate in academic and athletic events. Her children take swimming lessons at the Saginaw YMCA, and she pays for above-average grades.

"It's not, 'Can I go to college?' It's 'What college will I go to?'"

Teachers praise the family's interest and enthusiasm in education.

"Robert is an excellent student," says Richard D. Hagerty, a math teacher at Ricker. "He was very enthusiastic. He asked questions when he didn't understand."

"But his mother is a real driving force in his success. She's a very informed, interested and caring parent. That makes all the difference."

NEWS STAFF/JASON COONT.

Robert D. Doster, 14, will combine math, science and bike repair this summer.

Delta pedals human-powered machine

If you think that the bicycle being pedaled down the street bears an uncanny resemblance to your old bike, you might just be right.

Thanks to last summer's Human Power Vehicle Program, many beat-up old bicycles received a new lease on life.

The program, directed by Jack Crowell, a math professor at Delta, took 25 minority youths and taught them the concepts of science, math, and physics in a unique way: by rebuilding old bicycles. The program also stressed exercise and the bicycle's design as a human-powered machine.

"We wanted something the kids could relate to," said Crowell. The program's basic goals were to teach the students that scientists and engineers are made, not born, and to encourage them to take science and math courses in high school.

A two-year grant from the United States Department of Energy set the stage for the program. Delta College worked with the Macro Michigan Multicultural Pre-Technical Education Partnership (M3PEP) to implement it.

It began last spring with a community-wide request for old bicycles.

The request didn't go unanswered; so many bikes were offered up that Crowell couldn't collect them all.

The bicycles were taken to Delta's International Centre in Saginaw, where students transformed them into brand-new bikes. The kids got to

keep their repaired bikes, free of charge. Lack of time prevented the students from working on second bikes, as originally planned.

In one of the highlights of the program, 15 of the students participated in the Tour of the Thumb, a

"I hope that other people get into this program, get off the streets and do something with their lives."

KIESTON REECE
Saginaw Teenager

bicycle tour sponsored by the Tri-City Cyclists. The teens rode through Harbor Beach, Port Austin, Sebawaing and finally Bay City on their three-day excursion.

What do the kids think about the program? Kieston Reece, 13, from Saginaw, enjoyed it because it allowed kids to exercise their minds.

He also liked being able to fix old bikes and participating in the tour. Reece believes that more programs like this one would help the

Above: Kieston Reece, 13 of Saginaw, adjusts the seat of a bicycle at the International Centre in Saginaw.

Far Right: Reece fixes a pedal on the bike.

Middle Right: Jack Crowell supervises Kenisha Fentress as she works on a bicycle.

Bottom Right: Crowell demonstrates how to tighten the handle bars on a bicycle.

e program to teach math, physics

country's urban violence problem. "I hope that other people get into this program, get off the streets and do something with their lives," he said.

Reece plans to come back next summer when the program resumes. Reece's mother, Barbara, also thinks that the program is a good idea. She feels that it's a new experience for kids.

"A lot of kids don't get to experience things like that," she said.

Fifteen-year-old Kenisha Fentress hadn't ridden a bike in two years before this summer. Now, she rides her fixed-up 5-speed around her neighborhood.

Fentress thinks that it is a "very educational program," and it's very helpful with math skills. She enjoyed being with other people and going on the bike tour.

"A lot of people didn't think I could do that race, but I did it," Fentress proclaimed.

Fentress would encourage other kids to participate in the program, and intends to return next year.

Delta students have the opportunity to fix old bicycles, too. Crowell invites any interested person, regardless of experience, to help fix some two-wheelers.

His goal is to repair 30 bikes and possibly some wheelchairs by Christmas. For more information, contact Jack Crowell at G-206 or phone ext. 9052.

— Ashley Vasold

Students push bodies and minds in Delta program

Throughout most of July, 25 eighth and ninth grade students pushed both their minds and their bodies to see what they could achieve.

Students in Delta College's new Human Power Vehicle Program were introduced to skills that enabled them to take apart and rebuild donated bicycles. At the close of the program, the students were allowed to keep the bicycles they built, and many of them rode those bicycles during a three-day trip that tested their skills as bike builders and their physical endurance.

The program, which was funded with a \$40,000 grant from the U.S. Department of Energy, encourages students to enroll in math and science classes and to consider careers in these areas. Jack Crowell, chair of the mathematics and computer science division at Delta College, developed the innovative program, with assistance from M³PEP.

Students met from 9 a.m. to 4 p.m. weekdays in the Human Power Laboratory at Delta's International Center in downtown Saginaw. There they used stationary bicycles, a treadmill, and instruments to measure output to gauge physical abilities and limitations. They also used wrenches, paint, and brushes to retool some bicycles that were in need of tender loving care.

The students participated in three 90-minute sessions daily,

Jack Crowell works with Kenisha Fentress in Delta College's Human Power Vehicle Program.

including 45 minutes of physical workouts. The program enabled students to explore the development and refinement of the bicycle design and to investigate its power source—the human body.

The weeks of indoor learning were followed by a three-day test of the students' physical endurance and bike-building skills. With the help of the Tri-City Cyclists, 14 student bike builders participated in a 150-mile tour of the Thumb. Students peddled through Harbor Beach, Port Austin, Sebewaing, and into Bay City.

In addition to Crowell, instructors were Deidra Knox, who taught the physiology portion of the program, and Martin Goodson, who taught the physics portion. Both are instructors at Delta College. Bruce Isotalo of Arthur Hill High School supervised the bicycle rebuilding.

Minority youths in grades eight and nine were eligible for the program, and student selection was based on interest, desire, maturity, and attitude.

FINANCIAL STATUS REPORT

(Short Form)

(Follow instructions on the back)

1. Federal Agency and Organizational Element to Which Report is submitted Department of Energy Chicago Operations Office		2. Federal Grant or Other Identifying Number Assigned By Federal agency DE.FG02-93ER79174.A001		OMB Approval No. 0348-0039	Page 1 of 1 pages
3. Recipient Organization (Name and complete address, including ZIP code) Delta College Finance Office University Center, MI 48710					
4. Employer Identification Number 38-4036011		5. Recipient Account Number or Identifying Number 3326		6. Final Report ☒ Yes ☐ No	
7. Basis ☒ Cash ☐ Accrual					
8. Funding/Grant Period (See Instructions) From: (Month, Day, Year) 02/01/94		To: (Month, Day, Year) 06/14/95		9. Period Covered by this Report From: (Month, Day, Year) 02/01/94	
To: (Month, Day, Year) 06/14/95		10. Transactions:			
		I Previously Reported		II This Period	
				III Cumulative	
a. Total outlays				19,251	
b. Recipient share of outlays					
c. Federal share of outlays				19,251	
d. Total unliquidated obligations					
e. Recipient share of unliquidated obligations					
f. Federal share of unliquidated obligations					
g. Total Federal share (Sum of lines c and f)				19,251	
h. Total Federal funds authorized for this funding period				19,266	
i. Unobligated balance of Federal funds (Line h minus line g)				15	
11. Indirect Expense					
a. Type of Rate (Place "X" in appropriate box) ☐ Provisional ☐ Predetermined ☐ Final ☐ Fixed					
b. Rate		c. Base		d. Total Amount	
				e. Federal Share	
12. Remarks: Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation.					
13. Certification: I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays and unliquidated obligations are for the purposes set forth in the award documents.					
Typed or Printed Name and Title Gregory P. Luczak, Assistant Controller				Telephone (Area code, number and extension) 517-686-9578	
Signature of Authorized Certifying Official				Date Report Submitted 08/09/95	