



## Veteran Education Transfer Plan Cover Sheet

Title of ETP	<i>Bar Coding: Extending an Automated Electronic Classroom</i>
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Sponsor Company	Synopsys, Inc.
Name of Mentor	Rebecca Sunda
National Board Certificate Area	National Board Standards for Middle Childhood Generalist Strand VIII. Assessment Strand X. Reflection
<p>I, the IISME <b>Fellow</b> named above, affirm that the ETP I am submitting is my own work, that I acknowledged sources where appropriate, and that I avoided including any proprietary information of the Sponsor Company. By my submission I am assigning to IISME my entire copyright in the ETP. I understand IISME is simultaneously granting me a license to use the ETP for pedagogical purposes.</p>	
_____ Signature	_____ Date

Category	<p><i>Curriculum</i>  Subject: Math      Science      Technology      _____  Level: Elem      Middle      High      Other</p> <p><i>Staff Development</i>  Describe _____</p> <p><i>Other</i>  Describe _____</p>
Objectives	<p>The extension of the bar coding project will expand the function of this powerful tool. The same objectives will be sought in this Advanced ETP with expansion into the area of student academic grades.</p> <ul style="list-style-type: none"> <li>• Increase lesson planning time (X. Reflection)</li> <li>• Decrease the response time to student performance (VIII. Assessment)</li> <li>• Automate teacher tasks (VI. Multiple Teaching Strategies for Meaningful Learning)</li> </ul>

Abstract (50 words or less)	The plan is to increase my productivity as a teacher. This will occur in two ways: 1) through decreasing the response time for feedback, such as grades, and assignment completion, which I will be giving to students, and 2) processing administrative duties in the classroom thus increasing the time I will have to dedicate to lesson planning and student to teacher time. The productivity increases will be achieved through the integration of technology into the classroom. The technology to be deployed will be bar coding.
<b>Describe how your ETP aligns with the National Board Standard stated in your proposal.</b>	There are two significant ways in which my ETP aligns with NBTS. The first way is through increasing the amount of time that will be dedicated to reflective teaching due to the efficiency at which routine tasks will be completed. The second is providing students with timely feedback regarding their performance of various assignments or assessments.
Describe the connection between your ETP and the Summer Fellowship.	Technology and its integration into Synopsys is key to its success. The use of barcodes or magnetic ID's is used throughout the company to track material or employee access. ID cards have an embedded magnetic bar code which contains information about the employee who poses the card. I see the benefit of barcode technology in that it allows an efficient and effective means to process data and track student achievement. This technology can be effectively used in the classroom and I believe that I have obtained the necessary equipment and knowledge to apply this technology to other areas of my classroom.
Growth-Measurement Devices	Identifying the increased amount of time devoted to students and creation of quality lesson plans. Much of the measurement will be of qualitative devices. Students will receive feedback on work they have completed resulting in increased student participation.
Resources Needed	<ul style="list-style-type: none"> <li>• All equipment has been obtained</li> <li>• Database in Microsoft Access</li> </ul>
Evaluation/Assessment Measures Used	<ul style="list-style-type: none"> <li>• Comparing year to year student performance</li> <li>• Measurement log of time devoted to assessment, reflection, teacher/student time and lesson planning</li> </ul>
Formatting specifications	PC ____ or Mac ____ ( <b>Must be in Word or Text Format</b> ) Software used _____
Submitted Copy	Soft and hard copy due to peer coach by the end of the summer fellowship. Also, a copy of the cover sheet signed by a school site administrator submitted to IISME Oct.3, 2004 to receive \$300 grant.

I, the **Mentor** named above [please select one of the following],

- have read the attached ETP, and my comments, if any, appear below.
- have read the attached ETP, and, as outlined in the IISME-Company Fellowship Agreement, have reviewed it on behalf of the Sponsor Company, and have determined that the ETP does not contain any Sponsor-proprietary information. My additional comments, if any, appear below.

Comments:

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Signature

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Date

**Administrator's** comments:

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Signature

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Date

## **BAR CODING: EXTENDING THE AUTOMATED CLASSROOM**

**Created by Dennis D. Vaughn, IISME Fellow**

**Sunnyvale Elementary School District  
Summer 2004**

### **I. OVERVIEW**

Expanding upon last years ETP of integrating bar code technology into the classroom the plan is to increase my productivity as a teacher. This will occur in two ways: 1) through decreasing the response time for feedback, such as grades, and assignment completion, which I will be giving to students, and 2) processing administrative duties in the classroom thus increasing the time I will have to dedicate to lesson planning and student to teacher time. The productivity increases will be achieved through the integration of technology into the classroom. The technology to be deployed will be bar coding.

### **II. ACKNOWLEDGEMENTS AND RESOURCES**

There are a number of individuals who have helped to make this project possible. I would like to acknowledge those individuals at the front of this report.

Michael Dye	Lockheed Martin Corporation	Technical assistance
George Masters	IISME Fellow/Metro Ed	Database design
Rebecca Sunda	Synopsys, Inc.	Computer, books and time
Kelly Vaughn	Vaughn, Inc (a.k.a. my wife)	Support and encouragement

These individuals believe in this project and support the expansion of educational knowledge.

### **III. NATIONAL BOARD STANDARDS FOR PROFESSIONAL TEACHING STANDARDS**

National Board Standards for Middle Childhood Generalist

- Standard X. Reflection
- Standard VIII. Assessment

#### IV. PURPOSE

Each day student Language Arts Journals are graded upon California Content Standards. Students use their journals to write in throughout the day and receive a grade based upon what they have accomplished.

The use of bar coding will allow for student work to be recorded quickly and accurately into a database. The student's information in this database will be able to be accessed and assessed efficiently. Response to student work is critical in motivating students.

#### V. PROJECT DESCRIPTION

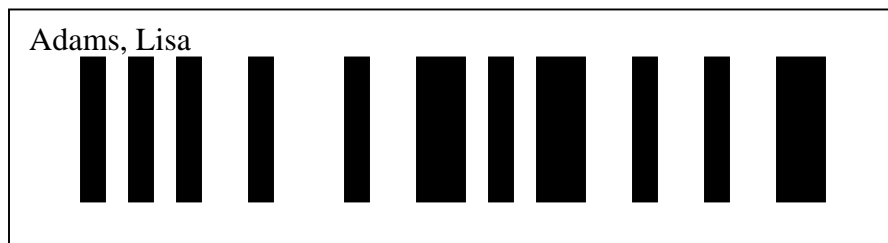
##### A. Curriculum Topic

Language Arts has been selected as the second phase of the bar code project because it is linked directly to California State Standards.

##### B. Bar Code System for Documenting Student Grades

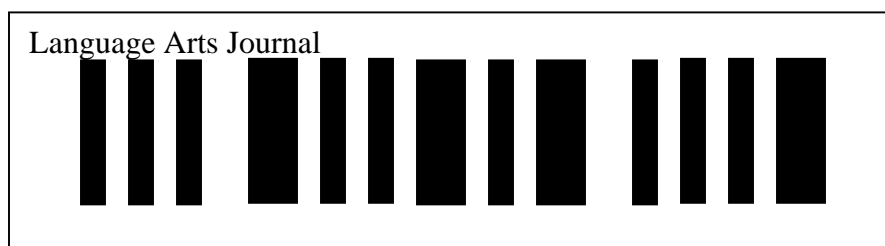
Below are the steps involved in the bar code process. Each student will be assigned a specific barcode. This barcode will be a function of their name. The bar code label will be referred to as **Student Profile bar code label** (see Figure 1A). This barcode label will contain the student's name encoded into bar code symbology and the student's name.

**Figure 1A. Student Profile bar code label**



In addition to the **Student Profile bar code label** there will be a **Student Language Arts Journal bar code label** (see Figure 1B). This label will contain a bar code indicating to the open database form that this is homework.

**Figure 1B. Student Language Arts Journal bar code label**



### C. Database

The database for this phase of the project will consist of either a stand-alone database for Student Language Arts Journal grades or will be combined with the Student Homework database. The database will consist of two tables, two forms, and one report. The first table **Student Profile table** (see Figure 2) will consist of student data indicating information such as student last name, first name, and student ID number. This field will be accessed and data will be entered through a form titled **Student Profile form**.

**Figure 2. Student Profile table**

STUDENT ID	LAST NAME	FIRST NAME
110022	ADAMS	LISA
110023	BENNETT	GARY
110024	CHO	DAVID

The second part of the database will consist of the **Student Language Arts Journal table** (see Figure 3). This table will consist of the fields “STUDENT ID” which is the primary key and a field for each of the ten weeks in a quarter. The Sunnyvale School District distributes grade reports every ten weeks or each quarter. Student homework data will be entered into the **Student Language Arts Journal table** through the **Student Language Arts Journal form**.

**Figure 3. Student Language Arts Journal table**

STUDENT ID	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
110022	2	2				
110023	2	2				
110024	2	2				

The third part of the database consists of the **Subject report**. This report allows the teacher to navigate to the appropriate form and table.

#### D. Procedures

Step 1 (see Figures 1A and 1B)

- Student submits Language Arts Journal on last school day of the week.
- Language Arts Journal will have; 1) **Student Profile bar code label** and 2) **Student Language Arts Journal bar code label**.

Step 2 (see Figures 2 and 3)

- Teacher visually reviews Language Arts journal for current week.
- Teacher makes the **Student Profile form** active
- Teacher scans student's **Student Profile bar code label**
- Student's scanned **Student Profile bar code label** indicates to the database that the next data to be inputted will be for that specific student i.e. Lisa Adams

Step 3

- Teacher selects the **Subject report** from the **Student Profile form**
- Teacher selects the "**Language Arts**" button on the **Subject report** in order to access the **Student Language Arts form**
- **Student Language Arts form** becomes the active dialog box

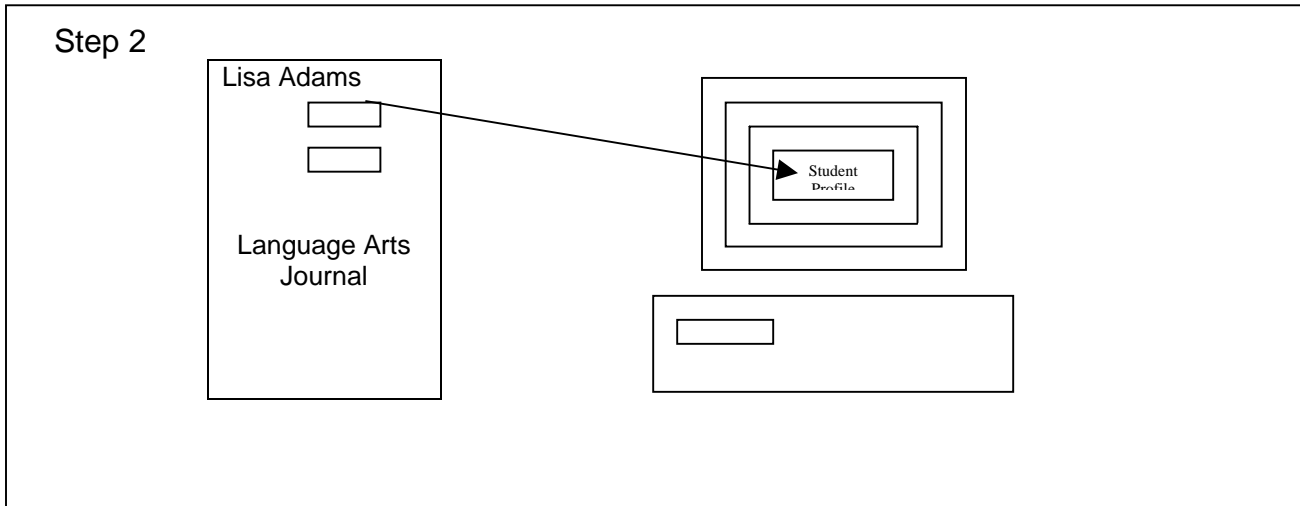
Step 3 (See figures 5 and 6)

- Teacher scans student's **Language Arts Journal bar code label** indicating this is Language Arts
- Language Arts grade for current week is automatically entered into the appropriate cell for that particular student in the **Student Language Arts Journal table**

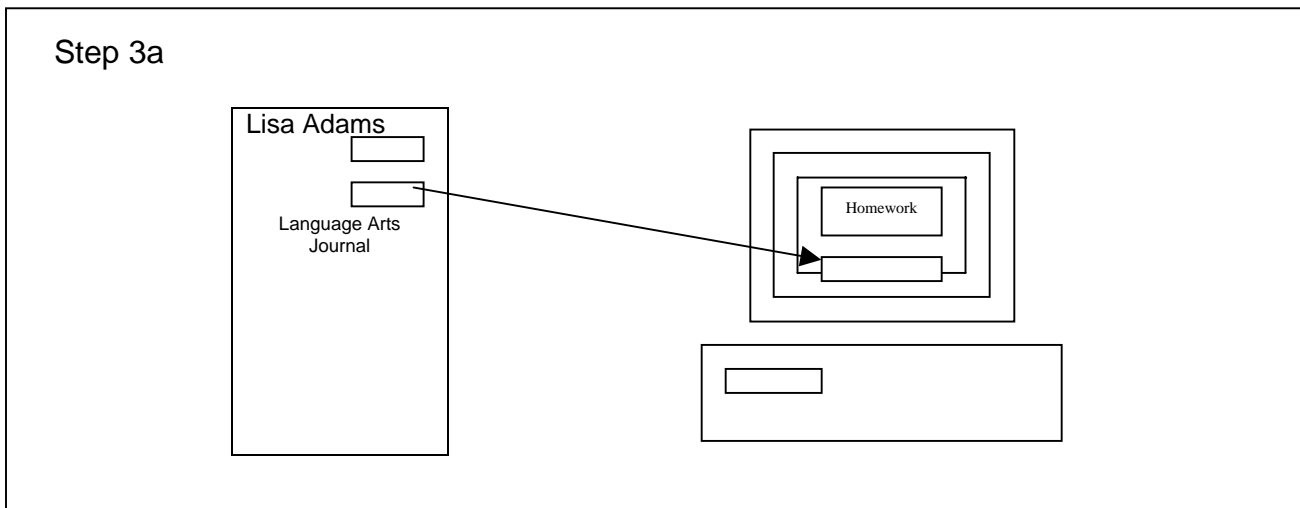
## Step 4

- Repeat Steps 1-3 for next student

**Figure 4. Student Profile bar code is scanned into Student Profile table**

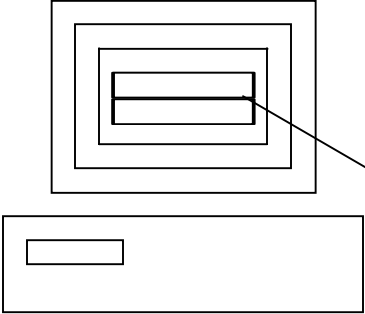


**Figure 5. Language Arts Journal bar code label is scanned into Student Language Arts Journal table through the Student Language Arts form**



**Figure 6. Student Language Arts Journal table can be accessed to determine that the student has received credit for the current weeks Language Arts Journal.**

Step 3b



Name	Number	Language Arts Week 1	Language Arts Week 2	Language Arts Week 3
Jones, Lisa	090294	2	2	2

## VI. PROGRAM BENEFITS

The use of bar coding student material and work will provide increased time to devote to analysis, reflection and time with students.

- Increase lesson planning time (X. Reflection)
- Decrease the response time to student performance (VIII. Assessment)
- Automate teacher tasks (VI. Multiple Teaching Strategies for Meaningful Learning)

## VII. BAR CODING: EXTENDING THE AUTOMATED CLASSROOM

The foundation of the bar coding system is a database. Understanding how a database works and how to create them can be a challenge, but very rewarding.

The first step is to create a database from a software program such as Microsoft (MS) Excel or preferably MS Access. MS Access is a very powerful tool used to manage large amounts of information. MS Access is a relational database software, which organizes data in a manner that allows for quick access and entry. This is ideal for teachers who may have to track many students, subjects and grades. Much of how databases function require a great amount of logic skills. Taking a class or using basic database design books such as the *Dummies* series is very valuable. If you have never worked with databases before be careful of getting discouraged, it takes time and effort to understand them and use them effectively.

You may also have to purchase MS Access for your computer. Check before you buy though, because many school computers come with MS Access preloaded.

The two pieces of hardware required is a bar code reader and a wedge keyboard cable. I may need to take a couple of steps back though. Before getting a bar code reader or necessary cables you need to have a personal computer with MS Windows.

Many companies are willing to donate items such as bar code readers and cables. I recommend contacting companies, which provide bar coding products.

## VIII. OUTCOMES AND EVALUATION

The method of evaluating the effectiveness of utilizing bar coding technology to increase teacher efficiency and therefore lead to more teacher time with students and lesson planning will be measured in two ways. The first method of measurement of teacher efficiency will be comparing time devoted to recording student Language Arts Journal grades manually and then comparing that to bar coding. The process will be tested over one quarter and times recorded on a spreadsheet (see Figure 7).

**Figure 7. Time Comparison Spreadsheet**

WEEK	START TIME	STOP TIME	TOTAL TIME	MANUAL	BARCODE
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					