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Southwestern College is located in the southern part of San Diego County, 12 miles south of the city of San Diego and eight miles north of the U.S.-Mexico International border. Because of its location, SWC attracts students from a wide range of ethnic origins, including many with limited proficiency in English. Approximately 73% of the student body come from ethnic minority groups (up from 48% in 1980) with Hispanics comprising the single largest ethnic group; 48% of the student body. In addition, English is not the native language of 43% of SWC students; it is not the native language of 77% SWC Hispanic students.

Approximately 250 students enroll in the SWC Architecture Program each semester. About fifty percent (50%) of the SWC architecture program's student enrollment are ESL or limited English speaking students who require instructional support in order to succeed in their architecture classes. These students need to increase their problem solving abilities and strengthen oral and written skills, thereby improving comprehension and decreasing attrition of ESL students. The solution this project proposes is to incorporate visual learning techniques into the program curriculum and provide staff development inservice to other SWC faculty to help them integrate visual learning techniques into their instruction.

The traditional form of classroom instruction is geared to students with an auditory learning style: they learn well from lectures and classroom discussions, and are able to distill key concepts from these modes of instruction. However, limited English proficient students are at a disadvantage with an auditory form of instruction; they need to translate the information while they are listening to it, which may interfere with their absorption of the content. Many limited English proficient students have a more visual learning style; they focus better on visual cues, are better able to understand material in a more graphic format (a chart, graph, or outline), and tend to visualize the material they read. Incorporating instructional techniques that address the needs of visual learners can increase the success of the ESL students in our Architecture program. The proposed program will both incorporate visual learning techniques into the curriculum and provide training to students on using graphic communication in their thinking and problem analysis.
Most laymen assume architects use graphic communication to present finished design solutions or to produce technical drawings used to construct structures. However, the real designing or thinking take place amid a sea of freehand sketches that are remnants of a critical, visual, internal deluge. The term graphic thinking distinguishes the use of graphics used in thought from graphics used in presentations. Graphics should play a significant role in design and problem solving, provoking thought and act as catalysts for ideas rather than limited representations of products or decisions.

The basic force behind emerging problem-solving methods is the systems theory. Systems theory hypothesizes that the essence of any organization or system lies as much (or more) in the interaction among its parts as it does in the nature of each part. Through sketches, the architect communicates with others and develops his own ideas in a way that constantly focuses on the systems characteristics of each problem.

Recent research with ESL students supports the fact that the traditional way of teaching from part to whole can actually make learning more difficult because many students lack the broader conceptual frame work that the details fit into. Freeman (1989). An example of the use visual thinking techniques to teach writing is given in Writing the Natural Way, a book by Gabriele Lusser Rico. In teaching, she asks her students to use a technique of diagramming ideas in loose random clusters, so that they can discover strong patterns of whole or complete ideas that reflect their feelings. Through this process, students are often able to discover very strong motivating ideas that allow them to begin writing with conviction.
This application significantly impacts the area of Access in the Basic Agenda Priorities. It accomplishes this in the following ways:

It establishes means of providing a cohesive and cooperative campus climate for all students within the educational setting through continuous assessment and the modification of campus services, programs and activities. The VATEA Legislation calls for collaborating with basic skills’ areas and strengthening student abilities in context areas. This project will extend a "partnership" of vocational education and ESL faculty and develop teaching strategies.

It intensifies efforts to increase the number success of underrepresented students in transfer programs. The project seeks to ensure greater understanding of course material and a lower attrition, higher transfer rate. It will provide a greater problem solving abilities increasing success in transfer programs. It also specifically aligns with course material offered by post secondary providers.

It increases the number of successful underrepresented students in vocational education programs. The project will provide an introduction to the architecture/engineering program through ESL/Architecture co-teaching units. It will provide continued support by identifying language acquisition needs of students for possible follow up in basic skills’ areas. It will also provide an interdisciplinary model curriculum for vocational education programs.
The specific eligible program this application addresses is Program Development. The project addresses the special learning needs of educationally disadvantaged students. It does this by developing a model curriculum designed to increase problem solving abilities and strengthen oral and written skills in ESL students by teaching graphic methods for abstracting, analyzing and reinforcing complex concepts. It also will promote and encourage a model of interdepartmental cooperation to provide support in basic skill's acquisition for ESL students.

The Basic Agenda area this application is addressing is Access. This project will extend a "partnership" of vocational education and ESL faculty and develop teaching strategies. The project seeks to ensure greater understanding of course material and a lower attrition, higher transfer rate. It will provide a greater problem solving abilities increasing success in transfer programs. It also specifically aligns with course material offered by post secondary providers.

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Addressed. The drop-out rate for ESL students in SWC’s Architecture program is approximately 33%. These students have problems understanding classroom instruction, assignments and materials. These problems may be traced to the learning styles of these students, not any innate ability or level of preparation beyond their language comprehension. They need more assistance in adapting the educational materials and assignments to a format that is more consistent with their styles of learning. Therefore, we propose to integrate visual learning and graphic thinking techniques into the program’s curriculum to help address the needs of these students.

The project will seek to develop a curriculum that is successful in teaching the use of visual thinking techniques to solve architectural and general problems. Emphasis will be placed on introducing graphic communication skills to make the process of problem-solving more accessible to ESL students. The development of this curriculum will be a collaboration of vocational education (architecture) and ESL faculty. This "partnership" will provide an opportunity to introduce and make accessible vocational education courses to students in the ESL program. Through co-teaching units, visual thinking techniques will be introduced to students in the ESL program. In addition, language acquisition needs of architecture students will be identified and follow up in basic skills' areas provided.

A portfolio of instructional materials will be assembled to be used by architecture faculty and to be disseminated to other interested faculty. It will contain a bibliography, lectures and course readings on theory as well as exercises and projects. This material will be made accessible to all California Community Colleges. The results to the findings will be presented at the International Conference of the Design Communication Association.

The proposed solution was chosen over alternative solutions for the following reasons:

The language of visual thinking is graphic in nature and is a universal language. This makes learning accessible to students with a limited knowledge of English.
Through the use of visual thinking complex concepts can be abstracted and analyzed. This allows students to learn from whole to part.

The principles of visual thinking as applied to problem-solving can be applied not only to architectural problems but to other academic disciplines and life in general.

The proposed project develops a curriculum that will allow increased performance in architecture students, enhanced English acquisition in ESL students and greater success in architecture transfer students.
The primary population served by this application are the ESL students enrolled in the architecture program. Secondary populations served are the English speaking architecture students and students in the ESL program. These populations need the program proposed by the application for the following reasons: (1) To increase their problem solving abilities and strengthen oral and written skills, thereby improving comprehension and decreasing attrition of ESL students; (2) To guarantee success of all architecture students at the post secondary level by introducing core curriculum in use at this level; (3) To introduce to non-Architecture ESL students to programs available in vocational education and to develop an awareness of alternative methods of thinking and solving problems in general.
The goal of the project is to integrate graphic communication and visual learning techniques into the Architecture curriculum at SWC, to meet the instructional needs of the high percentage of ESL students enrolled in the program. Specific project objectives include:

1. Select and form a representative project advisory committee that includes representatives from vocational education faculty, ESL faculty and post-secondary providers.

2. Form a "partnership" of ESL and vocational education faculty to develop teaching strategies, materials and activities. This includes; Instituting an interdepartmental support system to assist ESL students. Identification of co-teaching units and language acquisition needs of students for possible follow-up in basic skills' areas.

3. Develop model curriculum for a "Graphic Communications" segment of the Architectural Design II course. The model curriculum will be in the form of a portfolio containing a bibliography, lectures and readings on theory, and exercises and projects.

4. Disseminate model curriculum and materials. This includes printing model curriculum, a one-page summary and notice of materials availability. The model curriculum will be available to interested faculty and students through distribution by the campus bookstore. It will be disseminated at workshops and annual meetings of the California Community Colleges. The findings will be presented at the International Conference of the Design Communication Association (after the completion of the grant term).
The first step in implementing this project is to select and form a representative project advisory committee. The Project Directors will identify potential members, request their participation on the committee, and schedule and hold the project advisory committee meetings. As part of the process of developing model curriculum materials, the Project Co-Directors will meet with the Advisory Committee to identify curriculum requirements, conduct additional applications research on Visual Thinking and ESL, and purchase the materials required to produce project. The Project Co-Directors will review their initial findings with advisory committee at this point, and obtain the Committee's input on ESL teaching techniques, interdepartmental vocational education applications, transfer requirements and co-teaching applications in the curriculum. The Project Directors will then write the curriculum additions, review them with the ESL advisor, and review them with the Advisory Committee. They will then use the input gained to revise the curriculum and assemble the teaching materials portfolio.

The Project Co-Directors will then pilot test the model curriculum in selected classes to evaluate its effectiveness. They will meet with Mr. Larry Munton (Dean of Engineering and Technical Studies and project Supervisor) to identify evaluative measures to use with the pilot test. They will then use the newly developed curriculum and lesson plans in the classroom setting. These pilot classes will be monitored by ESL advisor for her input and feedback. The instructors will collect feedback on the model curriculum from students and then revise the lesson plans, incorporating feedback from students and the ESL Advisor. The revised curriculum and pilot test results will then be reviewed with the advisory committee.

As part of the process of disseminating model curriculum materials, the Project Co-Directors will assemble the final portfolio of instructional materials, review then with the advisory committee, and print the model curriculum guide. These materials will then be used in staff development workshops for SWC faculty and at external workshops and conferences. Notices of the availability of the materials will be mailed to other Community Colleges in California; more complete curriculum materials will be disseminated on a cost-recovery basis as requested.
The following outcomes will be achieved:

1. A representative project advisory committee, including representatives from vocational education faculty, ESL faculty and transfer institutions will be developed to provide ongoing input into the integration of visual thinking and graphic communication techniques into the College curriculum.

2. A "partnership" of ESL and vocational education faculty to develop teaching strategies, materials and activities will be formed and active.

3. A model curriculum for a "Graphic Communications" segment of the Architectural Design II course will be developed, in the form of a portfolio containing a bibliography, lectures and readings on theory, and exercises and projects.

4. Model curriculum and materials will be disseminated to all California Community Colleges and other interested educational agencies and institutions. The model curriculum will be available to interested faculty and students through the campus bookstore. It will be disseminated at workshops and annual meetings of the California Community Colleges, and will be presented at the International Conference of the Design Communication Association (after the completion of the grant term).

Impacts of this project will include:

The short-term impacts of this application on these target populations include: (1) the development of a curriculum and support system (ESL/Architecture) that will improve the performance and success of ESL students in the architecture program; (2) the introduction and collaboration of students and faculty in the vocational education and ESL programs.

The long-term impacts include increased success of transfer architecture students, the acquisition of a method of problem solving that is interdisciplinary and applicable to general problems, and provision of a model curriculum for other departments and schools serving these populations.

The impact of the project on the college include those mentioned above under impacts on the system. In addition, it provides a cohesive and cooperative campus climate by the collaboration of two departments within the college to share strengths and provide support for students. The impact of the project on the California Community College system includes a model curriculum and
portfolio of instructional materials that present a solutions to systemwide problems, such as providing access to and ensuring success in vocational education programs and transfer programs.

Potential for continued support after the expiration of the grant.

This project will potentially become part of the architectural design course curriculum. This will include a printed portfolio of course material available to students faculty through the campus bookstore.

Potential for adaptation to other institutions or programs

The use of this type of learning style has potential for many classes that teach techniques of problem soiling, such as engineering, interior design and graphic design. The model curriculum developed may be adapted by these programs at SWC and at other post-secondary and secondary educational institutions.
The evaluation of this project will take two forms: formative, process evaluation and summative, outcome evaluation. Process evaluation will include monitoring of the project activity milestones, to ensure that they are performed in accordance with the projected timelines. In addition, the Project Supervisor will conduct ongoing progress checks to ensure that the project is proceeding on target, both in terms of content and methodology. He will help the Project Co-Directors identify any unexpected problems or obstacles, and develop ways to address any problems. The Project Supervisor and Co-Directors will determine whether there is a need for adjustments in timelines, project staff assignments, or work sequence to ensure accomplishment of project objectives by the end of the project year. Staff development and dissemination activities will be evaluated by participants through workshop evaluation instruments and verbal feedback.

Feedback on the effectiveness and presentation of the model curriculum will be obtained from students in the pilot classes throughout the pilot testing period. The curriculum will be revised in accordance with student and faculty feedback. More detailed outcome evaluation data will be collected after the completion of the term of the grant. This information will include a comparison of student outcomes (test scores, class retention, etc.) in the pilot classes. This information will then be compared with student outcome data for the same courses taught in previous semesters (that did not incorporate the model curriculum) to determine the impact of the curriculum revisions on student outcomes. Another Architecture course will also be used for comparison purposes, to determine the extent to which time lapse in offering the course, instructor differences and differences in students account for the effects measured.

Results from the process and early outcome evaluations will be incorporated into the final project report and disseminated to all participating faculty for purposes of continued program assessment and improvement.
The final outcome of this project will be a report documenting the project outcomes and successes. The report will include a course syllabus including a bibliography, lectures, readings exercises and projects, a portfolio of instructional materials including a bibliography, lectures, readings exercises and projects, and a written summary reports and/or oral presentations made by participating faculty members and the project director. The final report will make recommendations to the Chancellor's Office for the implementation and improvement and implementation of similar programs at other California Community Colleges.

This report will be submitted to the Chancellor's Office for approval and, upon receipt of that approval, will be disseminated to all California Community Colleges through the following activities:

1. Abstracts of the report will be mail to the Vice President of Instruction, Academic Senate, Dean of Vocational Education, and the Dean responsible for E.S.L. at each California Community College. Full copies of the report will be provided upon request.

2. At least two copies of the final report and related project materials will be submitted to the Chancellor's Office.

3. Full copies of the Project Report and related materials will be provided to interested parties upon request, on a cost-reimbursement basis. In addition, Project Staff will answer inquiries about the project and provide technical assistance to other colleges implementing similar projects as time and resources permit.

4. The Project Director and Coordinators will present reports of the project design and outcomes at appropriate state, regional and national conferences, as time and budgets allow. Potential dissemination opportunities include regular conferences and meetings scheduled by the following groups:

a. The California Association of Community Colleges

b. The Conference of California Vocational Education Deans

Southwestern College requests $13,570 from the Fund for Instructional Improvement to develop and implement the proposed Curriculum Development for a Graphic Communication Course Project.