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ABSTRACT

Support for Teachers Enhancing Performance in Schools (STEPS) is a World Wide Web and CD-ROM electronic performance support system (EPSS) designed for preK-12 and preservice educators to assist in designing and developing lessons, units, or curricula; this tool was developed around school reform and accountability initiatives in Florida. To achieve the four areas of accountability (i.e., integrated curriculum, integrating technology, alternative assessment, and diverse learning environments) and to maintain that all teachers would be able to use STEPS for instructional planning and ongoing support, the following variables were established as development guiding principles: easy access; user interface; teacher planning model; scaffolding for guidance; teacher developed and tested materials; and plan for continuous evaluation and revision. Six components were established within STEPS: (1) Lesson Architect, a guide through the instructional planning process; (2) Tutorial Library, 40 instructional tutorials centered around the four areas of accountability; (3) Model Units, designed for teachers to use as models for planning their own units; (4) Related Web Links, over 400 annotated links to relevant, reliable Web sites; (5) Best Practices Database, accessible by Sunshine State Standard and subject area or keyword; and (6) Coach, scaffolded help. A diagram of STEPS is included. (Contains 13 references.) (DLS)

STEPS: An EPSS Tool for Instructional Planning

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Introduction

Support for Teachers Enhancing Performance in Schools (STEPS) is a World Wide Web and CD-ROM EPSS designed for PreK-12 and preservice educators to assist in designing and developing lessons, units, or curricula. This "just-in-time" tool was designed around school reform and accountability initiatives in the state of Florida. School districts are required to align existing district-level standards to Florida's new Sunshine State Standards (which is Florida's response to Goals 2000). Educators are required to implement the Sunshine State Standards in all subject areas. Districts will be held accountable for student outcomes related to the Sunshine State Standards through a new test, the Florida Comprehensive Achievement Test (FCAT) beginning in 1999.

To educate both preservice and inservice educators on the new Sunshine State Standards, massive staff development is required across the state. Rather than conducting exhausting hours of inservice training where hundreds attend, receives a notebook, and promptly returns to the classroom to continue with business as usual, it was concluded that a virtual approach to training and continuous support would be more effective and reach the critical mass of educators in a shorter time frame. With the goal of training teachers on Florida's Sunshine State Standards, it became apparent that an electronic performance support system (EPSS) could serve as an innovative approach to staff development and ongoing support. The anticipated outcomes include day-one performance of instructional planning using the Sunshine State Standards; ongoing support through scaffolding instructional tutorials and guidance within STEPS; and for idea sharing among educators across the state with all outcomes geared around the four primary areas of accountability.

Areas of Accountability

Instructional planning is geared around four areas of accountability common in restructuring efforts: (1) integrated curriculum; (2) integrating technology; (3) alternative assessment; and (4) diverse learning environments. For educators to weave the four areas of accountability into the instructional planning process, it was critical that teachers understand more clearly what each area means within the individual classroom setting as well as in the larger school and district-level environment.

Integrated curriculum is defined differently by elementary; middle and high school teachers. Elementary teachers view integrated curriculum as a common strategy for instructional delivery. Elementary teachers typically plan for thematic units across curriculum areas and teach the same kids throughout the day. Middle and high school teachers have a more difficult time adjusting to this approach simply due to the "departmental" structure within the school environment. The mathematics teacher teaches mathematics and in the past has not considered how to weave other subject areas into his or her classroom. Nor has it been contemplated how to team teach with teachers of other subject areas. The complications continue when trying to plan for the team approach when teachers do not have common planning time or when teachers do not serve the same students.

Integrating technology is a restructuring effort that most teachers agree should be accomplished; however, pitfalls arise when software and hardware are not available; when teachers are not trained; and when teachers do not have the time required to learn new technologies (U.S. Congress, 1986). With all of the barriers that exist, many teachers do not achieve true technology integration within the classroom environment for several years. It may never be achieved without district and building-level administrator support (Northrup & Little, 1986).

Alternative assessment is used very loosely within the school environment without much consideration to instructional alignment of objectives, content, and assessment strategy. Using various integrated curriculum models such as problem-based or project-based learning further complicate an educators understanding of how to assess. Many teachers consider the data collection strategy such as using a portfolio the solution to alternative assessment. However, many teachers do not further define the data elements that should be included within the portfolio nor the assessment criteria that should be used to judge the quality of the work.

Diverse learning environments can be defined by educators in two general categories: (1) the learning environment and (2) the learner. Within the learning environment, a teacher may choose to use cooperative learning as a grouping strategy or may choose to integrate instructional technology into the classroom. When examining the individual learner, multiple intelligences, learning styles, and diversity are considered. Many veteran teachers intuitively adjust teaching style and strategies based on the composition of learners in the classroom. Preservice teachers do not have the prior knowledge of how students learn to intuitively make decisions regarding the learning environment and the learner. A formal system of analyzing the learner and the environment has not been embedded in teacher planning strategies, nor are many educators aware of the subtle differences among learners and strategies that can be used to meet their needs.

Critical Design Variables

To achieve the four areas of school reform and accountability and to maintain that all teachers would be able to use STEPS for instructional planning and ongoing support, several design variables were established as guiding principles for the development of STEPS. Variables include:

Easy access. STEPS was designed as a World Wide Web and CD-ROM tool. It was a given that all teachers do not have Internet access in the classroom. However, the team decision was *not* to design for the past but for the current-day classroom environment and the future. Most teachers have access to a CD-ROM. By delivering STEPS using both formats, it was determined that most teachers can gain access to STEPS either in the classroom or at home.

User interface. STEPS was designed with the novice Internet and CD-ROM user in mind. The interface is simple; free of extraneous information; and free of unnecessary graphics, animations, and videos. Consideration for download time via the Internet required forethought on message design decisions. STEPS has a button bar extending the entire left column of the screen with text and graphic buttons for user navigation. STEPS provides directions within the program along with a Coach for scaffolded navigational assistance as required by the user. The theme of STEPS varies by grade level cluster and is followed throughout the individual components.

Model for teacher planning. STEPS must be a model for teacher planning geared around the four areas of school reform and accountability. Using the Events of Instruction (Gagne, Briggs, and Wager, 1992) as the guide, teachers were involved in the design of the model for planning. Used within the model, are "teacher words" as opposed to the nine events of instruction as stated throughout our field. The Events of Instruction is the underlying framework with teacher-driven terminology overlaying. We found this to be a significant step to making the tool usable. Additionally, we found that the model for teacher planning would be somewhat different based on the grade level cluster and the integrated curriculum approach (thematic, problem-based, and project-based learning).

Scaffolding for guidance. Given that STEPS is a tool used by teachers in their own environments, it is critical to provide the support that all educators may require. Scaffolding is a logical design strategy. Educators using STEPS may opt for additional information through instructional tutorials or for additional navigational assistance. It is assumed that STEPS will be used for ongoing staff development at that point of need. STEPS is designed for teachers to use over and over again. It is assumed that the scaffolding will become less necessary as teachers gain familiarity with the tool.

Materials within STEPS are teacher developed and tested. All materials within STEPS are designed by practicing educators who know what works in the classroom. Teachers were contracted to work on the project and began development after learning about the Sunshine State Standards and understanding the four primary areas of school reform and accountability. Teachers developed unit plans, best practices, and identified web sites that would work in their classrooms. All materials have been reviewed by a quality assurance team and have been extensively field tested by practicing teachers and preservice teachers.

Plan for continuous evaluation and revision using concurrent design principles. STEPS has been designed using a variety of models including rapid prototyping (Jones, Li, & Merrill, 1992); prototyping (Tripp & Bichelmeyer, 1990); and Layers of Necessity (Tessmer & Wedman, 1990). The concept of concurrent design (Witt & Wager, 1994) and evaluation (Northrup, 1995) have permeated the process. In designing an EPSS, initial goals can be established, however, the user interface is the key to successful utilization and must be tested and revised throughout the development process. Additionally, given that all of the components within STEPS are inputs and outputs of the entire system, continuous evaluation and revision are essential.

Components within STEPS

To determine the components within STEPS, attention was placed on the overarching definition of an EPSS and how the EPSS, STEPS should be structured. Gery (1991) defines an EPSS as an integrated environment that contains a full range of information, software, guidance, advice and assistance, data, images, tools, and assessment and monitoring systems. The key component of Gery's definition is that an EPSS will permit job performance with minimal support and intervention by others. Raybould (1995) further suggests that the outcome of an EPSS is to "enable individuals to achieve required levels of performance in the fastest possible time and with a minimum of support from other people." Sherry and Wilson (1996) suggest that the potential of an EPSS to assist employees in gaining job-related skills are overwhelming. Employee skills are learned by doing, not by being taught. The result is that a relevant structure must be user-defined and the system must be flexible to accommodate for multiple uses of the EPSS system.

The conceptual framework established by Sherry and Wilson that employees learn by doing not by being taught and that the structure be user-designed and flexible served as the basis of STEPS. Recall that the purpose of STEPS is to assist preservice and practicing teachers in planning using Florida's Sunshine State Standards.

Based on the conceptual framework of: (1) flexibility; (2) learning by doing; and (3) a user-designed structure, while maintaining a clear vision of the purpose of STEPS, several component parts within STEPS were established. To guide the user through the instructional planning process, a Lesson Architect was created. The Lesson Architect is what Gery (1991) would label the Infobase. It includes information, tools, and the methodology for instructional planning. The information resources are layered so that users can pursue information in more depth, just-in-time and at the point of need. The support system or resources that interface with the Lesson Architect include: model units; a best practices database; web links to over 400 web sites; links to the Sunshine State Standards and to accountability information; and over 40 instructional tutorials. The user interface includes scaffolding for support and layered information/resources. The final layer of STEPS is an InfoMAP that maps the instructional planning process for educators (see Figure 1 for a Diagram of STEPS). A detailed description of each component follows:

The Lesson Architect

The Lesson Architect is the centerpiece of this EPSS tool. Users of STEPS will be guided to the Lesson Architect to begin the instructional planning process. Each component of the process addresses one of the four areas common in restructuring efforts, requiring users to contemplate how each component will be designed into individual lessons and activities. The theoretical underpinnings of the Lesson Architect are in Gagne's Events of Instruction (1992), the Dick and Carey model (1996), and through various curriculum approaches including webbing and threaded curriculum.

To use the Lesson Architect, users will insert information directly into forms provided on the world wide web page. Embedded within the Lesson Architect is scaffolded help and more in-depth information on each instructional planning element. Users can access the best practices database; the model units; or the web links to gather ideas for planning the unit or lesson. Additionally, instructional tutorials that will provide instruction on over 40 topics are embedded within the Architect. For example, one of the categories within the Architect is to write instructional objectives. A link to a tutorial that instructs users how to write an objective is included. Users can select to link to the tutorial if needed. Additionally, scaffolded help is available through another link that will describe how to enter information into the form or how to copy and paste information from another location on the web or within STEPS. Finally, a scaffolded link back to the InfoMAP will provide a concept map for users to determine where they are in the instructional planning process. When the Lesson Architect is complete, information can be submitted by selecting the submit button, the user can obtain a printout of the completed lesson plan, or can forward it on to the principal, the practicum teacher, or the COE instructor for review through email.

Tutorial Library

The Tutorial Library is a collection of 40 instructional tutorials that are centered around the four primary areas of focus: (1) integrated curriculum; (2) integrated technology; (3) alternative assessment; and (4) diverse learning environments. The purpose of the Tutorial Library is to provide just-in-time support to users who are attempting to plan using the Lesson Architect. For example, if a user wants to integrate email into an instructional lesson, but is unsure how to actually send and receive email messages, a tutorial on email is one click away. Tutorials are designed as 5-10 minute overviews with opportunity for users to investigate further through hypertext links to examples, resources, and more information on the specific topic of interest.

The Model Units

Four model units exist currently on STEPS. One model is designed for each of the four grade level clusters: PK-2; 3-5; 6-8; and 9-12. Each model unit was created by teams of teachers representing the grade level clusters. For grades PK-2, Communities is the theme with a 10-day model unit accompanying. Grades 3-5's unit is on 16th Century Florida History as students go online and search for missing Luna Ships in the Pensacola Bay. Grades 6-8 uses Native Florida Habitats as the theme. Finally, grades 9-12 uses Terrestrial Archaeology is the theme. All units were designed, developed, and implemented by cross-curricular teams of elementary, middle, and high school teachers. Each unit is comprised of 10 days of instruction designed using the Lesson Architect that models integrated curriculum, integrated technology, alternative assessment, and diverse learning environments. The model curriculum units make cross-curricular connections in Math, Science, Social Studies, and Language Arts using benchmarks established in Florida's Sunshine State Standards. Within the model units, there are embedded hypertext links to instructional tutorials, to relevant web sites, and to Florida's Sunshine State Standards. Additionally, video clips modeling various aspects of the unit including diverse settings, the use of technology, and others are available within the 10 day units.

The model units serve as a focal point for the themes within each grade level cluster. The units are designed for teachers to use as models for planning their own units using Florida's Sunshine State Standards. The units link to four online Internet expeditions that will be online beginning late Spring 1998. The expeditions enable teachers to fully integrate instructional technology in the classroom while following exciting expeditions by archaeologists, scientists, and community workers. (see http://www.uwf.edu/~pacee/steps to access the online expeditions).

Related Web Links

Over 400 web sites have been identified as relevant to Math, Science, Social Studies, and Language Arts to parallel Florida's Sunshine State Standards. Web sites are keyed to the Sunshine State Standards and provide a one-paragraph summary of the content addressed on the site. All sites have been evaluated for instructional integrity and can be used as a resource for teacher planning using the Lesson Architect and for classroom instructional use.

Best Practices Database

The Best Practices Database is a sharing success database of ideas that work in the classroom. Classroom teachers from several school districts have contributed to the best practices database by submitting lesson plans, ideas for classroom assessment, technology integration, cooperative learning, and more. Within STEPS, users can access the best practices database either by Sunshine State Standard and subject area or by a keyword search. Either approach will yield significant strategies and tactics that work in the classroom. It is intended that users of STEPS will access the Best Practices Database to gather ideas for instructional planning within the Lesson Architect.

The Coach

The Coach is the STEPS approach for scaffolded help. It is designed on three levels to provide scaffolded support throughout the entire program. Using the Knowledge Integration Environment presently being created by University of California - Berkeley as the model (Bell, Davis, & Linn, 1997), we have established a parallel "Knowledge Integration Coach" that will provide help on: (a) The Big Picture; (b) What Do I Do?; and (c) How Do I Do It? Each level of scaffolded help will serve as prompts and context-sensitive feedback as students work through STEPS.

Overall Benefits of STEPS

STEPS is an EPSS designed to assist preservice and veteran teachers in planning using Florida's Sunshine State Standards. Currently STEPS is being used by teachers throughout the state with great success. Practicing teachers welcome the just-in-time approach to learning how to plan using the Sunshine State Standards. Preservice teachers using STEPS are being prepared to enter the workforce with the most current knowledge, skills, and abilities in school reform and accountability. Both preservice and practicing teachers have a model for planning that includes support and guidance along with literally thousands of resources and ideas for classroom implementation. Teachers continue to report that resources available at their fingertips is the most significant benefit to them.

Though unanticipated in the initial design of STEPS, many other benefits have occurred. Individual school districts are requesting that STEPS be customized to meet individual district needs with lesson planning and with

best practices. Additionally, districts view STEPS as an optimal tool for virtual staff development within school and district staff development plans. It has been requested that we incorporate pre and post tests for instructional tutorials and for the Lesson Architect so that individual teachers may receive inservice points for completing components within STEPS.

Both preservice and practicing teachers and school districts are using STEPS in ways not originally anticipated. The conceptual framework of building a model that is flexible has not only gained benefits for the original intent, many view STEPS as an iterative process for continued design and development as a "one-stop shopping" tool for educators.

Conclusion

STEPS is an electronic performance support system currently being used by middle school educators in Florida. It's capability will be expanded to elementary and high school teachers in phase II of our grant, beginning Summer 1997. Additionally, STEPS is being used in Preservice Teacher Preparation courses to prepare teachers to integrate curriculum & technology, conduct alternative assessment, and work in diverse learning environments. The components of STEPS work in tandem to provide just-in-time training and support to teachers through the Lesson Architect and all of the corresponding materials. Finally, scaffolded help is provided to guide and facilitate the teacher through the instructional planning process using a nurturing, supportive approach with video and audio clips as a guide.

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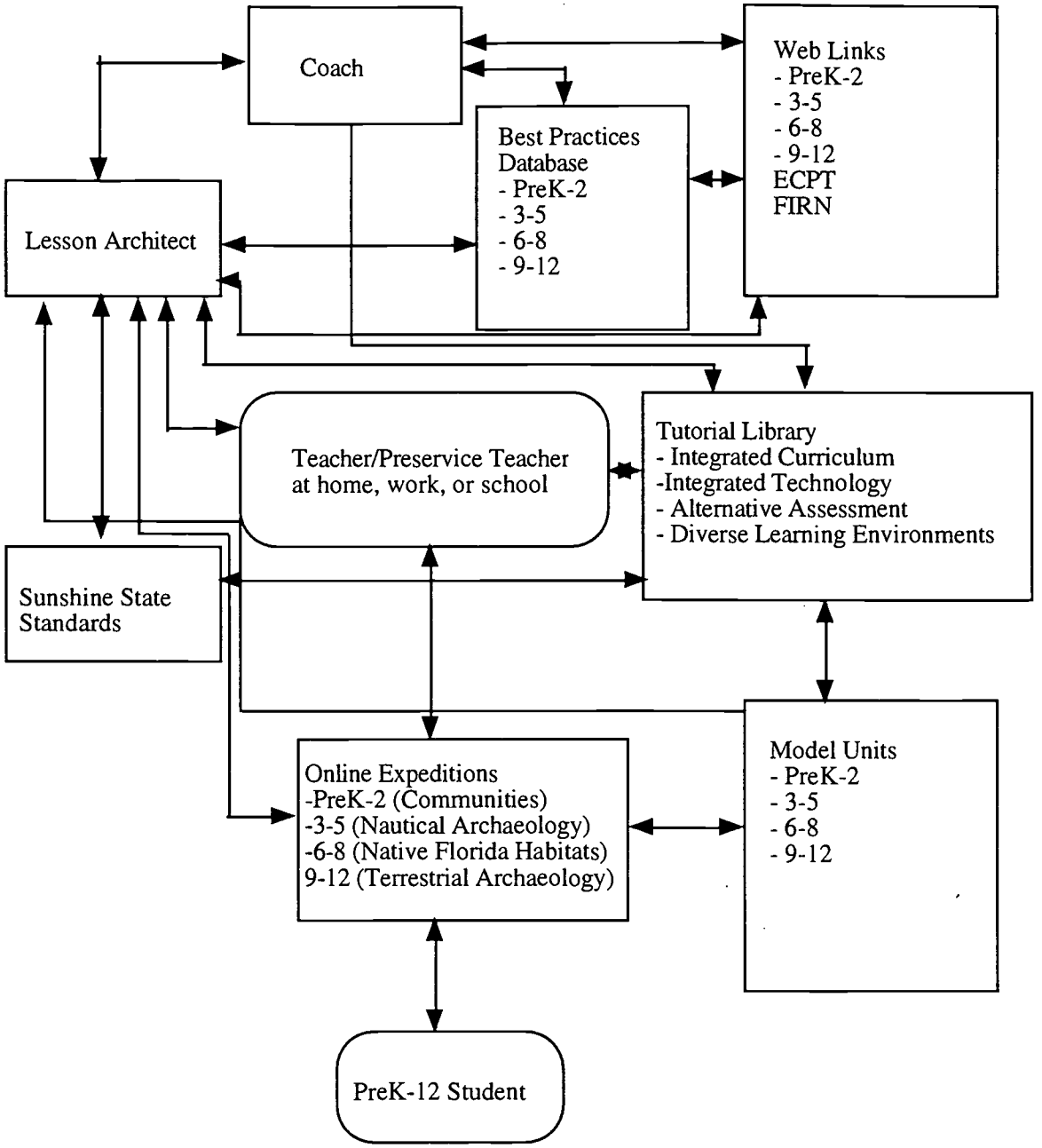
Figure 1: STEPS Diagram



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