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MULTIMEDIA PROGRAMS AND NEW COMPUTER TECHNOLOGIES: A LOOK AT TEXAS 4-H WILDLIFE SCHOOL ENRICHMENT PROGRAMS

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Abstract: 4-H multimedia school enrichment modules offer excellent wildlife educational opportunities for elementary students as we near the 21st century. Modules consisting of hands-on displays, interactive computer programs, videos, lesson plan activities, and pre/post-test components serve to reinforce information relative to topical issues in the wildlife arena. In Texas, modules have been developed entitled "The White-tailed Deer," "Wildlife Success Stories and Endangered Species," and "Something's Fishy." These modules and their duplicates are used as components of county 4-H programs and serve to deliver wildlife information to an ethnically and socio-economically diverse audience of third and fourth graders. Teacher committees are instrumental in developing and approving module content. Developmental and funding support for these modules and their duplicates has come from a wide variety of state and federal agencies as well as non-governmental organizations. Pre- and post-test methodology has indicated an approximate 50% increase in knowledge gained as a result of student exposure to these modules. Data collection/analyses/interpretation has provided a high degree of accountability documenting program successes. Results are published in county result demonstration handbooks and provided to sponsors in the form of annual reports. On-going efforts are being made to expand module availability within Texas as well as nationwide.

INTRODUCTION

Public and private school classrooms offer Extension a tremendous opportunity to reach youth with factual information about the conservation and management of our wildlife and fisheries resources. We in the wildlife and fisheries arena are especially fortunate because elementary-age children are naturally drawn to animal life of all shapes and sizes.

In public schools, the ethnic makeup of student populations closely mirrors the demographics of the community's population. This often allows us access to some "difficult to reach" audiences and exposes a greater number of youth to the 4-H program, which may serve as a mechanism to recruit new 4-H members.

4-H school enrichment programs also offer opportunities to network. First, we as wildlife and fisheries specialists can network with each other in the developmental phases of these modules, as well as with other Extension specialists (i.e., 4-H and Communications), county Extension agents, state, federal and non-governmental organization biologists, state education agencies, and local teachers. These individuals can be instrumental in helping to develop module themes, provide necessary resources, and/or review products to make sure they are on target.

In numerous discussions with elementary school faculty and administrators, it appears that modules should target students at the third or fourth grade level. It is in these grade levels that students learn much of the information that will provide a basis for their future attitudes/opinions. However, regardless of the grade level targeted, all are in agreement that these students must be reached before they leave the elementary school campus or it becomes increasingly difficult to affect their opinions/attitudes.

Most important of all is the establishment of a teacher committee to review and comment on module content. If you allow this group to guide you through the mazes and nuances of your state's mandated curriculum requirements, then the program will be a success. Quite simply, teachers will embrace and use a product that they have ownership in, and word-of-mouth advertising from one school to another will be a great asset in selling the idea of your module to schools.

A second type of networking is necessary to make module development a reality. Funding of any new program is a cause for concern among all Extension wildlife and fisheries specialists as budgets continue to tighten. Unless your state is the exception, development of these programs cannot be accomplished using hard dollars; therefore, grant funding must be sought to achieve module development. In my case, I have found it easier to raise funds and hire expertise to conduct certain activities (rather than do them myself) such as computer programming, data entry/analyses, and display layouts. In many cases, this expertise can be found within your own university.

A number of local, state, and federal agencies as well as nongovernmental organizations and conservation groups are interested in financially supporting successful educational opportunities for two reasons: 1) they have a vested interest in the conservation of wildlife in this country; and/or 2) they have a vested interest in the education of youth relative to natural resources conservation and management. Nothing breeds support (the financial kind) like success; therefore, statistically valid results made available to sponsors in the form of annual reports substantiate the fact that their dollars were truly well invested. Invite sponsors/potential sponsors on-site to see students interacting with the modules to witness wildlife management information being taught and

absorbed in a formal school setting. This approach is far superior to making awareness presentations using slides or other visuals. Chances are good that if you can get them to the school, your efforts may result in an additional sponsor or supporter.

OBJECTIVE

Our objective in providing 4-H wildlife school enrichment modules to elementary schools is very simple: To make factual, research-based information on topical issues surrounding wildlife and fisheries resources available to elementary school students. To accomplish this objective, we hope to continue creating modules depicting various scenarios as well as duplicate existing modules to make this information available to every school system in the state via the county Extension 4-H program.

PROGRAM PROMOTION

Another important aspect of conducting successful school enrichment programs includes promotion and marketing. First and foremost, never miss an opportunity to credit sponsors and partners for their developmental/financial support. Computer menu screens and trailer/display signs should give credit to other individuals, agencies, and groups as well as serve to advertise the module to the public.

Probably the best promotion of a new module is to conduct a kick-off event at its debut. Mini-tours can be set up to demonstrate teachers and students interacting with the various module components. Print and news media should also be invited to cover the module debut. Special guests that should be invited to such events include university (Extension) administrators, school district administrators, state and local elected officials, and sponsors/partners that were involved in developing/funding the module. Once the module is scheduled and on its rounds to various participating counties, county Extension agents are encouraged to invite local media to cover the module's presence in local schools. This approach can gain considerable publicity for the program and enhance the existing county 4-H program's visibility.

A great by-product of television coverage is a half-inch VHS version of the interview. Copies can be made and sent to agents/schools requesting information about the program. These 3- to 5-minute TV interviews show the essence of the module and are a tremendous marketing tool.

Once a module has finished its pilot stage (usually 1 school year), a nice four-color summary publication should be developed detailing program protocol and results. This is also another opportunity to acknowledge partners and sponsors.

PROGRAM PROTOCOL/SEQUENCE

The program protocol consists of several steps including: 1) module development, 2) contact with and advertisement via county Extension faculty, 3) module scheduling and coordination, 4) program delivery, 5) program evaluation and 6) reporting.

A commonly asked question by volunteers and county Extension agents is the time commitment required to conduct the program. My standard reply is "probably less time than you spend on almost any other result demonstration." The time invested includes module setup and breakdown and delivery of the 60-day post test (if utilized). While it would be nice as specialists or agents to have time to follow and teach the module at each participating school, it is also impractical. If the module design does not allow it to stand on its own and be taught comfortably by teachers normally lacking a strong science background, then the module is a complete and utter failure!

The program sequence on individual campuses may vary, but typically consists of: 1) a brief orientation and delivery of teacher resource materials 1 to 2 weeks prior to the scheduled starting date; 2) pre-testing before the module arrives; 3) participation in the various module components (display, video, lesson activities, and/or interactive computer); and 4) immediate and/or delayed post-testing. We recommend that modules without the computer component reside on participating campuses for 1 full week. If the module contains an interactive computer component, the stay should be increased to 2 weeks per campus.

MODULE PORTABILITY

As a 4-H school enrichment module is developed, portability and mechanisms for transport should be in the back of your mind. Modules can become elaborate, but the more fragile the components (especially display items), the more difficult the setup and takedown. Remember, the idea is to provide a brief orientation, then have county faculty or volunteers capable of setting up the module without your supervision. In Texas, agents pick up the module directly from another county or from the district Extension office where the module resides, whichever is closer.

The use of small enclosed trailers has been very helpful in facilitating module transport from school to school. Almost everyone has access to a vehicle with a trailer hitch, while fewer have access to a suburban, van, or pickup with a camper top to move the module. Under no circumstances should the module be transported in the open bed of a pickup—one good thunderstorm can wreck a \$15,000 investment!

MODULE COMPONENTS

The hands-on display is the centerpiece of the 4-H wildlife school enrichment modules. The pictures and text blocks should be clear and concise with each designed to convey a specific message. However, the display should consist of more than just pictures and words. Deer antlers and jawbones, mounted wood ducks, turkey beards, and fiberglass fish replicas help bring the display to life and encourage participation by students. As one teacher stated, "If all you provide is pictures and text, you might as well just give the students a book!" The key is to encourage hands-on participation. Wear and tear will require some maintenance and replacement. However, we have been surprised by the resiliency and life of module components after 4 full years of almost continuous use.

The display should be set up in a focal or high use area on each campus. A foyer, stage, library, or other centrally located area makes a good location. Remember, although modules should target specific grade levels, there is nothing wrong with other grades viewing various module components. The more exposure, the better.

Of all the module components, it should not come as a surprise to anyone that the interactive computer programs receive the highest ratings from teachers and students alike. This fact was reinforced when one teacher stated that, "The reason for the success of the interactive computers is that they put children in charge of their own learning." This includes enhancing their computer skills by allowing them to make decisions within each menu using a mouse. Few school administrators and teachers will miss an opportunity to increase student exposure to computers. We very nearly opted to go with touch screen technology when the computer programs were initially developed, which in hindsight would have been a big mistake.

Computers can be set up in individual classrooms or in a central location such as a computer lab or library. The inclusion of listening posts and headphones allows for student use individually or in small groups. Our preference is to locate computers in individual classrooms so students can access the programs when other work is completed.

A real asset of the computer program development occurred quite by accident. We were lucky to have access to students themselves (as opposed to adults) to narrate the text in the computer program menus. One student served as narrator for all menus of the "Wildlife Success Stories and Endangered Species" program, while eight different youth were used to narrate the eight menus on the "Something's Fishy" program. We are convinced that this greatly enhanced the effectiveness of the computer programs.

The development of the interactive computer program is determined largely by your own programming skills and services you have available to you such as by a Department of Agricultural Communications. Personally,

I have no skill at programming. I have found it much more efficient to raise the funds necessary to hire the expertise to complete the interactive computer program. My participation in these facets of the programs is limited to developing the scripts and providing the slides/video clips necessary for completion. As with the display, computer program text/visuals were reviewed by the teacher grade level committee to determine subject matter appropriateness.

With the tremendous upgrade in hardware capabilities found on elementary campuses in just the past 3 or 4 years, the use of CD-ROM may soon eliminate the need to provide computer hardware with each module. This will also reduce the cost of program delivery. However, if this approach is pursued, a hybrid CD-ROM format is recommended that includes both Macintosh and Windows versions because on-site computer hardware varies greatly from campus to campus.

We are now in the process of making our interactive computer programs available for distance learning via the Internet. Starting in the fall of 1996, students as well as adults will be able to access these programs by providing a brief demographic database and participating in a pre-test. Once the program is completed by the user, they will have an opportunity to participate in a post-test to see if they improved their knowledge as a result of program exposure. Results will be downloaded by the Extension Data Center-Texas A&M University for data analyses.

The videos included with each module serve to reinforce teaching points included in display, computer program, and lesson plan components. Brief (< 30 minutes) videos are best at holding students' attention. Videos may be developed specifically for use with a given module, but that takes time, money, and (in particular) skills that I do not possess. In many cases, videos are commercially available that reinforce major teaching points without having to develop one specifically for the module. However, if time, resources, and technical support exist, a tailored video can greatly enhance the effectiveness of the entire module. In either case, multiple copies of videos should be provided to minimize time lost due to video sharing between classes.

Lesson plan activities cannot successfully be completed without substantial input from your teacher committee. Each state has mandated curriculum that must be taught in every subject. If these mandates are not only met but are also easily recognizable, you won't get your foot in the school door!

In Texas, we concentrate on meeting as many of the "essential elements" required for the science curriculum at the targeted grade-level as possible. This is the major reason why you should not shotgun your program toward multiple grade levels. Be specific in the grade level you target and write lesson plans to that grade level.

In addition, all students in Texas schools are tested using grade-level specific tests called Texas Assessment of Academic Skills (TAAS) to measure performance.

Students in grades three to five are tested annually using TAAS. Therefore, it makes sense to couch lesson activities in the same format as these state-mandated tests. Teachers in Texas instantly recognize lesson activities developed in the TAAS format and welcome the opportunity to provide additional “practice” for their students. We simply meet their format standards and plug in our wildlife subject matter information.

A number of additional activities are placed in the teacher resource guide beyond the TAAS activities. These include “fun” activities including word finds and crossword puzzles developed to reinforce key teaching points. In addition, we include several Project Wild activities (written permission required). In many cases, 4-H student guides and other 4-H materials are valuable information resources.

Teacher resource guides are provided in three-ring binders with indexed categories that include hard copies, transparency copies, and, whenever appropriate, student copies of each activity. It is very important to provide all copies (including pre- and post-tests) to the teachers. The idea is for teachers to do what they do best, which is to teach—not use their classroom time and budget trying to prepare for something we would like for them to teach. As an additional incentive for their participation, teachers keep the resource guides for future use.

PLEASANT SURPRISES

A number of unforeseen yet pleasant off-shoots have occurred as a result of 4-H module use in classroom settings. These are spontaneous activities that resulted because of student and teacher initiatives to explore wildlife beyond the materials provided. For example, on one campus a class of students with learning disabilities studied “The White-tailed Deer” module, then proceeded to team-teach the module themselves to all other classes on campus. It was an inspiration to watch these young people’s self esteem increase over the course of a week. They were clearly the resident experts and enjoyed teaching other students about the white-tailed deer.

Additional activities that have been conducted included a bulletin board project detailing the history and importance of white-tailed deer in Texas (“White-tailed Deer—Then and Now). Other highlights include team poster presentations as well as individual book reports on species, many of which were not featured in the modules.

Finally, one of the biggest surprises was the pride in each participant’s eyes upon receiving a “certificate of completion” signed by their county Extension agent upon completion of the course of study. There is no doubt that to a third or fourth grader, a nice certificate complete with their name is highly prized and appreciated.

ADDITIONAL ACTIVITIES

On occasion, experts have made themselves available to guest teach portions of the modules. These have included state game and fish agency biologists as well as game wardens. These discussions almost always result in requests for how to become a biologist or a game warden. It never hurts to plant the seed early to encourage a career in natural resources!

Although this could certainly fall under the previous category entitled “Pleasant Surprises,” one of the most important additional activities has been the supplemental use of the modules independent of school environments. Rather than being “moth-balled” on weekends and during the summer months, the modules have remained in constant demand for youth field days, summer camp programs, and even adult-oriented field days/events. If you were unaware of this fact, please note that a module developed to target today’s third or fourth grader is also just about right for the average adult!

PROGRAM EVALUATION

Perhaps the strength of these 4-H wildlife school enrichment programs lies in their strong evaluation component. In this day of increased accountability at both the state and federal levels, it is incumbent upon each of us as Extension faculty to make sure our program efforts are measurably successful.

Students are pre-tested (attitude) before each module arrives, post-tested (knowledge gained) at the end of the module’s stay on campus, then post-tested again (retention) 60 days after initial exposure. Tests are in a true/false and multiple choice format that are carefully reviewed by teacher committees as well as Extension Data Center personnel. The same test instrument is used for all tests; however, test copies are clearly labeled as to the testing period and color coded to avoid confusion.

Teachers are also requested to fill out a demographic sheet that lists each student’s name, gender, and ethnicity. This information is completely confidential but vital in assessing the program’s impact. Pre-tests, immediate post-tests, and the demographic data sheets are picked up when the module is moved. The county Extension agent returns to each participating campus 60 days following initial exposure to provide the final post-test copies to teachers.

Data comparisons include number of correct answers by testing period, comparisons of scores by testing periods, by student gender, by student ethnicity, and rural versus urban school performance (if applicable). All data is forwarded to the Extension Data Center-Texas A&M University for data entry and analyses. Data analysis is summarized and returned to the Extension Wildlife and Fisheries Specialist, who prepares and forwards individual 4-H result demonstration reports for inclusion in participating county Extension agents’ result

demonstration handbooks. These results are also provided to networking partners and financial sponsors to share program results.

During the pilot phase of a new module, it is also recommended that a teacher evaluation instrument be administered to gain feedback on module utility and performance. If the teacher committee's advice has been followed and the module developed is truly "teacher friendly," these evaluations will come back overwhelmingly positive. In any event, this feedback can be critical in making necessary adjustments to ensure future program success.

REPORTING

As indicated, the primary outlet for 4-H wildlife school enrichment program results is the county result demonstration handbook. However, once data is computer-logged, summary reports for a particular module used in numerous counties can be developed as needed to satisfy state and federal reporting requirements. Following the pilot study phase, a nice four-color summary publication of the project results serves as an excellent supplemental marketing tool. It also provides financial sponsors and network partners with documentation of a project's success that makes them proud of their involvement.

BUDGET

A frequently asked question regarding these 4-H wildlife school enrichment modules is "How much does it cost?" Certainly this is a question that should be answered before potential sponsors are approached with funding requests. We have been very fortunate in Texas to benefit from tremendous financial and in-kind support within both the 1890 and 1862 Extension programs. This inter-unit/departmental support has been invaluable at holding down development costs incurred primarily through interactive computer programming, display layout, and data entry/analyses. In addition, funding and developmental support from external agencies and organizations has been instrumental in program success.

Bank on the fact that there are a number of groups clamoring to get their messages into school systems. As a result, there is considerable competition for the limited time available. Modules must be well-designed and appear professional in order to effectively compete. While corners may be cut to save money, investments in equipment that will demonstrate longevity and represent Extension and 4-H in a positive light will pay dividends over the long haul. Well-designed and maintained modules should have a life of 5 or more years, which should drive down the cost of program delivery to no more than \$1.00-1.50/student.

An example budget for 1 module includes:

Display w/carrying cases	\$2,500
Computers (4 @ \$1,500)	\$6,000
Enclosed trailer (5' x 8')	\$2,200
Display items (2 copies of pictures/text)	\$1,500
Videos (25 copies)	\$ 300
Teacher Resource Guides (100 @ \$30)	\$3,000
Supplies (i.e., headphones, listening posts)	\$1,000
Data entry/analyses	\$1,000
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TOTAL	\$17,500

Please note that this budget was developed based on what it would cost to duplicate an existing module. An annual maintenance or contingency fund should be available for repairs, etc. Initial developmental and/or assimilation costs of display materials, interactive computer programs, videos, and teacher resource guides could double the cost, not including any indirect costs assigned by the university/agency.

RECOMMENDATIONS

The following recommendations are provided for those interested in developing 4-H wildlife school enrichment modules:

1. Identify/network with partners/sponsors
2. Establish a teacher committee to review materials
3. Target a specific grade level
4. Meet/address state-mandated curriculum requirements
5. Use a multi-media approach
6. Provide all materials, including teaching resources
7. Pre- and post-test to determine program impact
8. Schedule through county Extension faculty
9. Publish results via county and annual reports
10. Explore alternative uses of modules

It's not always easy to spot who the future hunters and anglers will be in a formal classroom setting. Hopefully, the use of 4-H wildlife school enrichment modules will serve to encourage participation in these pursuits by some of these students. However, much more important is the exposure of these students to factual, research-based information that provides a clear understanding of wildlife conservation and management and the roles landowners, anglers, and hunters play in maintaining wildlife and fisheries resources for future generations. After all, the elementary students of today are the policy-makers of tomorrow!