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## A Study to Assess the Diagnostic Medical Sonography Program at Tidewater Community College

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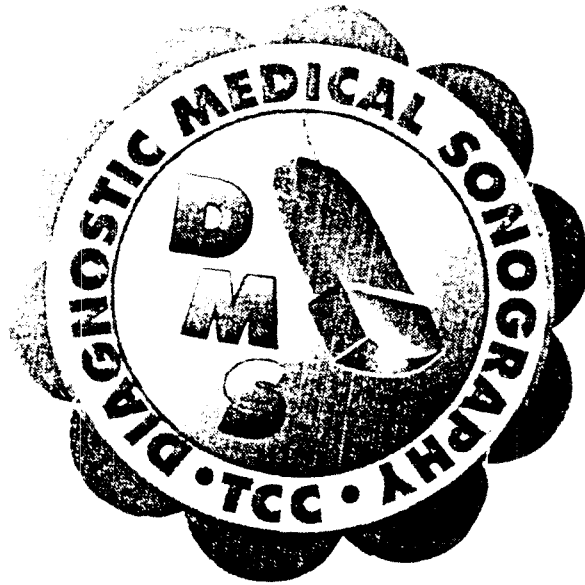
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*A Study To Assess  
The Diagnostic Medical Sonography  
Program*



*at  
Tidewater Community College.....*

*Presented by  
Felicia M. Jones  
August 2006*

## Approval Page

This research project was prepared by Felicia M. Jones under the direction of Dr. John M. Ritz in OTED 636, Problems in Education. It was submitted to the graduate Program director as partial fulfillment of the requirements for the degree of Master of Science in Education.

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8-2-96  
Date

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## CHAPTER I

### INTRODUCTION

As the only accredited Ultrasound program in the state of Virginia, the Diagnostic Medical Sonography (DMS) program at Tidewater Community College (TCC) serves to fulfill real needs for our community. Those needs are constantly changing however, and it is the responsibility of the program and the program officials to see that the program continues to change accordingly. National accreditation by the Committee for Accreditation of Allied Health Education Programs (CAAHEP) requires that there be regular monitoring of program effectiveness through graduate and employer surveys (Essentials for Accreditation in DMS, 1995, p. 65, 69 ). These surveys provide the means for continual improvement within the program curriculum.

All change must be guided by necessity. In Ultrasound, the need for change is driven by the fact that the field is a new and rapidly changing imaging modality. It has been said that everything a sonographer learns and all equipment used will be out of date within five years (modified from Merritt, 1995, p. AU3). This means that the educational needs of new sonographers are continuing to change also. Any program must be prepared to maintain flexibility and adaptability in order to remain worthwhile to the community. Currently graduates receive didactic training in Ultrasound Physics, Abdominal Ultrasound, Small Parts Ultrasound and Obstetrical and Gynecological Ultrasound as well as clinical education in these same areas. Constant monitoring of the graduates registry results and employer satisfaction are both utilized to



help monitor the effectiveness of the program. The advisory board for the DMS program can then vote to implement changes which will enhance the program. Most programs are undergoing significant changes within their curriculum in order to keep up with the demands for changes in health care (ARDMS Registry Reports, 1995, p. 4-6).

The need for change is also apparent in an overview of educational technologies available today. Curriculum changes must reflect the best method under which learning occurs. Many of those changes reflect the addition of instructional technology into the classroom. Decisions must be made on how those technologies should be best utilized in the classroom of the future.

This study will help determine the strengths and weaknesses of the DMS program at TCC, as well as recommendations for changes which will help the program meet the changing needs within our medical community, as well as the best interests of the students under our guidance.

### **Statement of the Problem**

The problem of the study was to identify the program strengths and weaknesses of the Diagnostic Medical Sonography program at Tidewater Community College and make recommendations for program enhancements.

### **Research Goals**

The primary goal of this study was to identify the strengths and weaknesses of the DMS program at TCC through graduate and employer surveys and to make recommendations for changes necessary to bolster program effectiveness. Contributing goals were:

1. Identify program strengths.
2. Identify program weaknesses.
3. Identify needs for curriculum reform.
4. Create a plan for curriculum reform implementation.
5. Implement curriculum changes through proper TCC and CAAHEP guidelines.

### **Background and Significance**

Diagnostic medical sonographers are an integral part of the health care system in our community as well as the health care system of the country at large. Sonographers are required to administer basic patient care in a diagnostic setting. The DMS program at TCC currently trains sonographers in those portions of Ultrasound pertaining to the field of Radiology, which includes Abdominal and Obstetrical and Gynecological Ultrasound.

Program effectiveness has always been followed through the results of graduates on their national Ultrasound registry. All graduates sit for the American Registry of Diagnostic Medical Sonographers (ARDMS) the October following graduation. The national pass rate for this test is approximately fifty percent. As of the class of 1995, TCC maintained a seventy-two percent pass rate (Table 1). Although above the national

average, program officials would like to see this number rise. There are relatively few jobs for Ultrasound in our area and passing the ARDMS registry is an increasingly important aspect of getting a position in this field. In order to maintain their competitiveness, the students at TCC must receive the most up to date training available for them.

Year	DMS Accepted	DMS Graduates	TCC Passrate	Vs.	National Passrate
			Physics	Abdomen	OB/GYN
90-91	8	8	62.5% vs. 46.8%	62.5% vs. 57.4%	75% vs. 53.9%
91-92	8	8	75% vs. 63%	75% vs. 60%	75% vs. 70%
92-93	8	8	64% vs. 51%	60% vs. 61%	63% vs. 62%
93-94	13	13	84.6% vs. 57%	84.6% vs. 61.2%	83% vs. 63%
94-95	12	8	75% vs. 55.7%	40% vs. 61.8%	60% vs. 60.7%
95-96	13	N/A			

Table 1-1. Registry results of previous TCC Diagnostic Medical Sonography Graduates.

Other considerations in this process are the changing needs in health care at large. More and more the emphasis is placed on multi-tasking, the ability of one person to perform multiple job tasks. Most entrants into the program are already Radiological Technologists, but other requirements are being asked of new graduates and TCC must answer to those requirements. In the existing environment of budgetary constraints, educational programs and health care settings alike are being asked to do more with fewer resources (Craig, 1995, p. 2-6). This means that there is increased competition for students entering health care programs and to remain competitive TCC must remain at the cutting edge of Ultrasound training.

Part of remaining at the cutting edge of training is introducing newly available means of educational tools into the classroom. Any technology must be used to ensure increased learning and prove to be an economical solution to the educational needs of the DMS program at TCC or whatever program they are utilized within (O'Banion, 1995, p. 18-23).

This study will allow the program to pursue curriculum changes based upon an assessment study and provide needed changes based on continuous change and learning outcomes (Stiegelbauer, 1994, (On-Line)). An ongoing process will ensure that the DMS program continues to change according to the needs of the students and the health care community. This, in turn, will ensure that the graduates continue to meet the needs of their employers and that new students are attracted to the DMS program at TCC.

### **Limitations**

This study is contingent upon the surveys completed by the graduates and their current employers. Since there are a limited number of students enrolled in the program each year, adequate survey response was imperative. Some graduates may not be employed in the field of Ultrasound or be lost to further follow-up due to relocation.

Feedback from graduate employers is especially important since it defines the requirements for employment within this area. Positive responses to this survey set the tone for future graduates hoping to obtain employment in this region.

Educational and student entrance requirements are placed on the program both through TCC and through CAAHEP which cannot be removed without jeopardizing the accreditation standings of the program. These must be considered when ever curriculum implementation changes are considered.

The program is limited by the number of clinical affiliates it can provide to the students which determines the amount of actual scanning experience they receive. The program is also limited by the number of didactic hours the students can attend. Both of these limitations create boundaries for the educational base of the program and what can be presented thoroughly to the students.

Curriculum changes are limited by the budget provided to the program by the Commonwealth of Virginia. Many instructional technology opportunities, especially in technical fields, are unrealistic given the programs operating budget.

### **Assumptions**

Several assumptions are made about the program as it exists and the students enrolled in it. They are:

1. All students of the DMS program at TCC are either a Radiological Technologist or have other basic health care experience.
2. The number of students allowed at each clinical site is governed by CAAHEP and not controlled by the program officials.
3. The educational requirements of the program are determined by the Commonwealth of Virginia and are not controllable by program officials.

4. All graduates sit for three sections of the ARDMS registry the October following their graduation.
5. Survey forms utilized were designed by and based upon the institutional assessment team at TCC.
6. A 100% ARDMS registry pass rate of all graduates is preferable.
7. The GPA of DMS graduates reflects their likelihood to pass the ARDMS registry.
8. A higher GPA represents increased student learning.
9. Students who receive a grade less than "C" while enrolled in the DMS program may be removed at the discretion of the Program Director.

### **Procedures**

Surveys were sent to graduates of the last three Ultrasound classes for response. This included the classes graduating in 1993, 1994 and 1995. Each graduate was also sent an employer survey and asked to give that survey along with a self stamped return envelope to their employer. All respondents were anonymous. The surveys covered the portions of Ultrasound each student was trained in while enrolled in the program at TCC and gave comment sections for further remarks. Also included was a student update form to help program officials keep up to date student records. This update form can be found in Appendix E.

Both surveys addressed the Ultrasound tasks taught at TCC and asked the student and employer to rate task performance, clinical experience and graduate weaknesses. Both surveys asked for opinions and comments regarding program effectiveness as well as strengths and weaknesses.

The surveys were then reviewed for strengths and weakness which were demonstrated by repeated comments and a numbered ranking of provided questions. Weakness were reviewed by the advisory board committee and suggestions taken for curriculum revisions within the program. Suggestions were written as objectives to be implemented within the next appropriate class.

### **Definition of Terms**

Many of the terms and abbreviations used in this study are specific to health care and the field of Ultrasound and may not be familiar to the reader. In order to familiarize the reader with these terms a short definition of each is given.

1. DMS: Diagnostic Medical Sonography. DMS is another term for Ultrasound.

2. Sonography or Ultrasound. Ultrasound is a diagnostic medical procedure which uses sound waves to produce images of internal organs and vessels.

3. TCC: Tidewater Community College. TCC is the sponsoring institution for the Ultrasound program in the study.

4. ARDMS: American Registry of Diagnostic Medical Sonographers. This is the national body that provides certification to sonographers across the country.

5. CAAHEP: The Committee for Accreditation of Allied Health Programs. This body ensures accreditation of the program at TCC and

programs throughout the country by providing national stands to maintain.

6. Assessment: a periodic review of program performance and effectiveness based upon existing program goals and student performance within the program and on the ARDMS registry.

7. GPA: Grade point average. The grading scale used in the DMS program at TCC is as follows:

A.....93-100

B.....85-92

C.....77-84

D.....69-76

F.....below 69

8. Instructional Technology: Any use of a computerized means of instruction within the classroom setting.

9. SACS: Southern Association of Colleges and Schools. This is an accrediting body of all southern schools which award Associate Degrees.

10. Abdominal Ultrasound: Any Ultrasound examination of the upper abdomen including Sonography of the liver, right and left kidneys, gallbladder, pancreas, inferior vena cava, aorta, biliary system, retroperitoneal cavity or spleen.

11. Small Parts Ultrasound: Any Ultrasound examination of the breast, scrotum, thyroid gland, knee, neck, adrenal gland, or other soft tissue portion of the body.

12. Obstetrical Ultrasound: Any Ultrasound examination of a pregnant uterus and its contents.



13. Gynecological Ultrasound: Any Ultrasound examination of a non pregnant uterus and the pelvic cavity.

14. Ultrasound Physics: The study of physics as it pertains to acoustics and Ultrasound imaging, including the instrumentation used to perform scans as well as patient safety concerns.

15. FTE: Full-time equivalent. This represents one full time student enrolled in the community college.

16. Full-time: A full time student is one who is enrolled in at least twelve credit hours per semester.

17. HRSA: The Health Resources and Services Administration.

18. VCCS: Virginia Community College System. This is the network of all community colleges within the state of Virginia. All institutions are led by a chancellor and follow a similar plan for curriculum and institutional changes within the future.

### **Overview of Chapter One**

Chapter I illustrates the constant change within education and the field of Ultrasound. In order to meet the needs of our students, the DMS program must be flexible and adaptable. Curriculum change is necessary, but must occur based upon need rather than a haphazard decision. This need can be determined through surveys such as this one performed on a regular basis. This is never a one time process.

Chapter II is a review of the literature supporting the need for assessment and careful planning before changes are implemented. It will also reflect the need for continuous changes within the field of Ultrasound.

Chapter III will provide methods and procedures used throughout this process. Chapter IV will detail the findings of this research. Chapter V will provide a summary of the research as well as conclusions and recommendations for curriculum updates in the DMS program at TCC.

## CHAPTER II

### REVIEW OF LITERATURE

Assessment is a requirement of any endeavor if it desires to remain dynamic and competitive. The assessment tools utilized for data collection in the DMS program at TCC were designed by and provided by its sponsoring institution, Tidewater Community College. These documents defined data pertinent to the first two goals of this research project.

Which were:

1. Identify program strengths.
2. Identify program weaknesses.

Other sources provided information about assessment and how it applies to community colleges, assessment in the field of Ultrasound and proper implementation of curriculum changes. These sources helped meet the directives from goals three through five of this research paper which were:

3. Identify needs for curriculum reform.
4. Create a plan for curriculum reform implementation.
5. Implement curriculum changes through proper TCC and CAAHEP guidelines.

All changes made to the DMS program remain guided by the accreditation requirements placed upon the program by CAAHEP and TCC. Suggestions for curriculum changes were presented along with the appropriate literature references. Where applicable curriculum changes were presented which reflect TCC's increased emphasis on instructional technology use in the classroom.

The remainder of this chapter will provide the reader with a review of information sources utilized in this study in order to meet the research goals and support the findings, conclusions and recommendations of this study.

### **Types Of Assessment**

Educational assessment began during the onset of educational reform in the mid 1800's. The use of standardized testing and a reliance on number values was praised as a means of objectively evaluating student performance. But pragmatic thinking began to emerge and insist that preparation for the work force was most important to students. This difference in thinking has led to a split in assessment techniques. Today there are three major psychologies related to assessment and how it is best applied to education. They are Norm-referenced assessment, Criterion-referenced assessment and alternative assessment.

Norm-referenced assessment stresses the use of standardized testing as a basis for all student performance. The basis for norm-referenced assessment lies in behavioral schools of education and it is currently the major form of assessment used in schools. Examples of norm-referenced assessment are aptitude tests, achievement tests and ability tests. Norm-referenced assessment is certainly useable, but all results must be able to be generalized and should be assessed along with other academic data when planning for educational futures.

Criterion-referenced assessment is more focused on testing students for certain skills. It is also based in the behaviorist school of education. These mastery tests are often used in vocational education and training

programs. Criterion-referenced assessment must be performed in an objective and consistent manner in order to be successful.

Alternative assessment has basis in the work of Dewey and subjectivism. There are two ways to apply alternative assessment. The first is to assess performance based objectives and the second is to assess real world performance (authentic assessment). In this method assessment may be performed through the use of interviews, observations or portfolios. This type of assessment stresses critical thinking skills.

All three types of assessment have validity and should be used as appropriate. To best serve our educational system, our students, and the community we serve, a combination of all types is best. The type of assessment used will depend on the educational objectives and goals (Peterson, 1995, (On-Line)). Classroom assessment is directly tied to the process of program or institutional assessment because one cannot succeed without the other.

### **Assessment in the Community College Setting**

Of utmost importance is to realize that all institutions are different and therefore all assessment techniques must be uniquely designed to serve the purpose for which it was intended. What assessment must provide is a genuine effort to improve institutional performance. Assessment involves all aspects of an institution, educational objectives, administrative objectives, student based objectives and community based objectives. This movement towards monitoring and improving institutional performance began in the 1980's and is now monitored through various accreditation bodies (Nichols, 1991, p. 4)

The following types of documentation are examples of those used in order to determine student outcome and achievement:

- review of student portfolios
- standardized test results
- graduate or professional school test results
- job placement rates
- employer surveys
- licensing examination results
- graduate surveys

Assessment should reflect student performance based on cognitive, psychomotor and affective skill performance and assessment surveys are designed in two major categories-- demographic data and opinions (Nichols, 1991, p. 68).

Assessment has changed over the years from a linear approach in the 1970's which stressed a focused innovation based on changes implemented by one teacher in one classroom at a time. Today assessment is approached in an overlapping process which stresses the well being of the entire school system. Today assessment reaches deeper in the educational systems and strives to alter attitudes and behaviors of the persons involved in the system (Stiegelbauer, 1994, (on-line)). Most assessment efforts in community colleges are now designed to enhance learning and create institutions where a variety of learning options are presented to students. Assessment is a necessity to the community colleges of today because the process allows an institution to predict, describe and respond to the needs of its students (Carter, 1986, p. 94). Without this process no community college can succeed.

To enhance the goal of improving instructional effectiveness, mission statements are being revised to emphasize increased faculty development and student success within the community (Banta, 1996 p. 320). Much faculty development is being focused on the use of increased instructional technologies within the educational process (O'Banion, 1995, p. 18-23).

Increased use of technology in the classroom can have a variety of implications, ranging from using an overhead projector instead of a blackboard to teaching a class over the Internet. By focusing on customer (student) needs and increasing the technology to which students are exposed in the classroom, educators are preparing graduates for successful entry into the workforce (Senge, 1995, p. 4).

### **Adding Technology To The Classroom**

The push to add technology to classrooms and make technology available for student use has increased greatly over the last two years. This change has its roots in several schools of thought. First, technology helps change instruction from a primarily passive process to a more active process. In order to meet the needs of today's students active learning must be the priority. Students are accustomed to using technology and they expect educators to be able to also. Educators are no longer the experts on all subjects taught in the classroom. They act more as mentors now. This trend is especially visible in the community colleges where students are often older and more vocal about their learning needs (Green, 1996, VCCS seminar).

Technology not only makes learning more active, but it allows educators to bring more real world experiences into the classroom. This is helpful when going to a site would prove too costly to be feasible.

Interesting enough, community colleges are ahead of most four year institutions when adding computer simulations or test banks into their classes but are lagging behind in their use of e-mail for student correspondence or Internet access. Community colleges tend to have more student oriented goals and that is seen in the fact that most community colleges spend technology funding to improve student access (Green, 1995, VCCS seminar).

Technology can also make the assessment process itself easier and less time consuming. By applying a norm-related assessment approach and utilizing computer based programs to assess scores, more time may be freed up for the teacher to spend with individual students. This, in turn, allows the instructor to more thoroughly observe student performance and utilize alternative assessment techniques. Student assessment is most effective when a combination of styles are utilized (Peterson, 1995, (On-Line)).

Certainly technology has begun to change our educational system, but budgetary constraints on most campus' will affect how much and how often new technology can be purchased. Prioritization helps ensure that purchases will benefit the greatest number of students possible (McCandless, 1995, p. 28). The fact is that technology should not be treated as the answer to all educational problems. Technology must be purchased only when it improves learning and meets the budgetary restrictions of the institution.



Many technology students prefer a structured, sensory approach to learning. Instructional technology helps add that to the classroom by providing the students with an image they can relate to directly (Beerman, 1996, p. 15). At TCC technology initiatives include the procurement of at least one full operational electronic classroom on each campus as well as several multimedia carts which are mobile through divisions (TCC, 1995, p. 9).

### **Assessment in Ultrasound**

Many technology programs are making changes in curriculum. Many of those changes are geared towards standard curriculum formats which are based on skills based learning objectives. The process of assessment in technology programs helps ensure that students are learning the skills necessary for them to perform as functional employees within the industry for which they are trained (Zeiss, 1986, p. 36). Education in Ultrasound needs to change the fundamental premises of instruction. The needed changes are clearly shown by the high failure rates on the ARDMS registries (Craig, 1996, p. 3).

Changes in instruction and curriculum should reflect the changing population of students encountered in the educational system. Students are older, with familial and/or work obligations to fulfill. As educators, we must engage the students' interest and allow learning to proceed at a rate more suitable to today's students. Along with these considerations we must also maintain educational standards. One solution may be more multimedia in the classroom which promotes a self paced learning environment (Scheponik, 1995, p. 23). Multimedia can also help

instructors add sections of problem based learning, case study review and review of situations that students may not see in their formal training period.

The National Commission on Allied Health recommends that educators in all allied health fields must produce graduates who better meet the needs of the health care community. They suggest that collaborative learning, flexible curricula and cross disciplinary training be utilized to further these goals and improve cost effectiveness and job security for new graduates (National Commission on Allied Health, 1995, p. 165-186). The commission also recognizes the fact that assessment of all changes are regulated by accreditation and licensure requirements of each individual program. As a technical field, it is imperative that graduates and employers be involved in the assessment process. They can add valuable insight into topics most needed by students for successful adaptation to the work environment (Banta, 1996, p. 97).

Assessment can also be performed on an ongoing and informal manner with methods such as writing to learn and writing across the curriculum. These methods can be a very helpful means of obtaining immediate feedback (Reiss, 1994, VCCS Seminar). This is but one method of focusing on the learner which will in turn motivate and engage the learner in class (Findley, 1995, p. 29). These represent a type of alternative assessment which stresses student involvement in the assessment process.

### Implementing Curriculum Changes

Perhaps the most important thing to consider when making curriculum changes is whether the changes are necessary and whether they will improve instruction. Students today have a variety of responsibilities and educators must consider those responsibilities when implementing changes. One aspect of outside responsibilities for students is that there is less time available for studying (Lowman, 1995, p. 5). Curriculum changes must reflect the needs of today's students if they are to prove to be effective. In view of the student of today, curriculum changes must also reflect an increased emphasis on technology and its practical uses including an emphasis on critical thinking skills (Fine, 1995, (on-line)). Although assessment has been mandated by most states, there is still often resistance to needed changes within institutions. Many instructors are wary of change, others perceive changes as a waste of time and money. In order for any changes to be effective within our educational system, the educators must believe them to be worthwhile (McKenzie, 1995, p. 1-5).

In all fields within the educational system there is reluctance on the part of some educators to change their teaching styles (Ornstien, 1993, p. 297). In order to help overcome this feeling, curriculum changes should be planned thoroughly and changes should be presented in ways which make the instructors feel they are involved in the process. By giving educators a feeling of ownership in changes of existing curriculum, they are more likely to support those changes. Barriers to change can be reduced by improving faculty training in new teaching methods, by increasing means of communication between the faculty and the

administration and by ensuring that the changes made are important to educational standards.

Students also have to feel that changes will benefit them and their performance in order to accept those changes. It may be a good idea to start with small changes, such as a writing to learn a "minute paper" (Angelo, 1993, p. 34). Tell the students what you hope to gain by using this technique and then share your findings with them. Avoid assigning busy work; instructors should be willing to complete any assignment they ask students to complete. Regularly starting to assess curriculum and content on a smaller level may help alleviate the need for more sweeping curriculum changes later on. It's important to remember that today's students come to us with very definite ideas about what they expect from their educational experience and unless we meet those expectations our programs will not remain in operation.

### **Summary**

In Chapter II, the importance of assessment was discussed. In today's competitive market for students and the FTE's they provide, any program must remain vigilant in its pursuit of academic excellence. Changes transpire quickly in a technical field such as Ultrasound and without assessment the program and all material taught in it can quickly become out of date.

In order to remain aware of the needs of our students as well as the community we serve, changes must be made in an ongoing manner with improved instruction and learning as the primary goal. The results of these changes will be reflected in improved student performance within the

program as well as on national testing examinations (the ARDMS national registry for DMS students). The tools necessary for these changes are already in place at TCC and need only be accessed, fine tuned and then utilized.

The Review of Literature indicates that successful completion of these goals can be attained through careful evaluation of these established assessment tools and through an increased emphasis on instructional technology and critical thinking skills. It also indicates that completion of this study will have a positive impact upon the students enrolled in the program, the program itself as well as the sponsoring institution, in this case, Tidewater Community College.

The instrument used to gather this information will be discussed in Chapter III, as will the population discussed within the study and the methods of data collection. Chapter IV will then discuss the researchers findings and Chapter V will discuss conclusion and recommendations based upon the outcome of the study.

## CHAPTER III

### METHODS and PROCEDURES

The purpose of this study was to perform an assessment of the DMS program at TCC, determine problem areas and initiate a plan to correct those deficiencies. Information regarding this topic was gathered through the use of a survey of program graduates and their employers. Chapter III will discuss the methods and procedures used to gather responses concerning the program and to establish program goals to be used in increasing program effectiveness.

#### Population

This study was completed by graduates of the DMS program at TCC for the 1993, 1994 and 1995 classes and their current employers. Employer surveys are available from only those graduates currently employed in Ultrasound. The total number of graduates for the 1994 and 1995 classes is thirty-two. Thirty-two DMS graduates were surveyed.

#### Instrument Design

The survey used for this study was a revised form of original TCC program forms. Survey questions were designed to contain both open ended and close ended questions and reflect the ability of the graduates to function in the work place effectively. The form was revised in conjunction with the institutional assessment officer and all forms were coded in order to allow program officials to determine return success rates. Closed end answers provided the respondents with five answer

choices each. A sample form of the graduate survey can be found in Appendix A and a sample form of the employer survey can be found in Appendix B.

### **Methods of Data Collection**

All surveys were mailed to graduates on May 15, 1996, with a cover letter explaining the program's desire to implement more effective and ongoing assessment. A sample of the cover letter mailed to graduates can be found in Appendix C and a sample of the cover letter mailed to employers can be found in Appendix D. A postage paid return envelope was provided to prompt return of the form. Employer surveys, an employer cover letter and a postage paid return envelope for employers was included. All graduates were asked to provide their employer with this information in order to promote anonymity.

In order to allow program officials to track student responses, all surveys were coded. A coding key is available for reader review in Appendix G. All codes were placed in the footer region of both graduate and employer surveys.

Since surveys were mailed to three classes, graduates have been out of the program for anywhere between nine months and two and a half years.

### **Statistical Analysis**

Data was tabulated and analyzed in order to meet the goals of Chapter I. All closed ended responses to the surveys were averaged to provided the mean response for each question. A mean was determined

by assigned an answer of excellent five points, an answer of good four points, an answer of average three points, and answer of fair two points and an answer of poor one point. These results are presented in Chapter IV in narrative and tabular formats. Open ended responses are listed for review.

### **Summary**

Chapter III discussed the methods and procedures for data collection in this research study of assessment in the DMS program at TCC. Surveys were used to collect data from graduates and their employers in an attempt to ensure program effectiveness. Chapter IV will provide survey results and Chapter V will discuss the conclusions and recommendations made based upon the results of this survey.



## CHAPTER IV

### FINDINGS

The purpose of this research study was to assess the DMS program at TCC and make recommendations for program improvements and changes to enhance post-graduate work performance. Skills were identified and assessed by program graduates and their current employers to help assess performance levels. The population consisted of graduates from three DMS classes and their employers. Thirty-two graduates were surveyed. approximately sixty percent of the population responded. The number of respondents adequately represent the DMS program considering the small program size.

#### **Diagnostic Medical Sonography Graduate Survey**

Existing TCC surveys were re-evaluated and revised with the assistance of the assessment officer at TCC. Graduates and their employers evaluated tasks taught while in the program and performed regularly in sonography departments. Performance levels were evaluated on a five point scale, utilizing excellent, good, average, fair and poor as the selection choices.

#### **Survey Results**

Thirty-two graduates were surveyed and twenty graduates responded. Employer surveys accompanied each graduate survey and ten employer surveys were returned. Questions are repeated below and the responses detailed in table format for reader review.

### Graduate Survey

Question One: In Which year did you graduate? Of the thirty-two graduates who were surveyed twenty responded by the designated due date. Of the students surveyed, there were eleven graduates from the class of 1993, thirteen graduates from the class of 1994 and eight graduates from the class of 1995. Of the respondents, seven graduates or 64 % responded from the class of 1993, eight graduates or 62% responded from the class of 1994 and five or 63 % responded from the class of 1995. See Table 4-1.

<b>Class</b>	<b>Surveyed</b>	<b>Responded</b>
1993	11	7
1994	13	8
1995	8	5

Table 4-1. Question #1. Year of Graduation of Respondents.

Question two: Are you employed in Diagnostic Medical Sonography? Of the twenty respondents, eighteen graduates are employed within the field of Diagnostic Medical Sonography. See Table 4-2.

<b>Employment</b>	<b>Number of Respondents</b>
Not Employed	2
Employed Full Time	15
Employed Part Time	3

Table 4-2. Question #2. Employment Status of Respondents.

Question two: If Yes, how long did you look for a position in Diagnostic Medical Sonography after completing the program? Seventeen graduates found work within two months of completing the DMS program at TCC. Two graduates were employed within four months. One graduate was employed within six months and no graduates required more than six months to find employment within the field of Diagnostic Medical Sonography. See table 4-3 for tabulated results. Graduates who answered no were asked to provide an open ended response in explanation. The responses, listed in table 4-3 show 85% of respondents had secured employment within two months of graduation.

<b>Date of Employment</b>	<b>Number of Respondents</b>
0-2 months	17
2-4 months	2
4-6 months	1
more than 6 months	0

Table 4-3. Question #2, cont. Date of Employment of Respondents After Graduation.

Responses to Question #2 For An Answer of NO and miscellaneous comments:

- I am currently working in a vascular lab.
- I got offered a position within approximately two months of graduation doing sonography and CT scan. I worked there for 1 year 7 months. I now do MRI full time (better job offer).
- I am not currently working because I just relocated two weeks ago (note: this graduate was employed within two weeks of relocation).

- I was pregnant and developed pre-eclampsia and delivered six weeks early. I plan on staying home with my premie for about one year, hopefully!

Question three: Please rate the following experiences and resources in the Diagnostic Medical Sonography Program at Tidewater Community College. Graduates were asked to rate their laboratory experience, laboratory equipment, classroom experience, faculty advising and support, clinical experience, clinical supervision, clinical rotations and the coordination of classroom lecture and laboratory exercises on a five point scale from poor to excellent. Responses are found in table 4-4.

Experience	Number of Respondents					Mean
	Excellent	Good	Average	Fair	Poor	
Laboratory Experience	6	11	3			4.15
Laboratory Equipment	1	7	4	6	2	2.95
Classroom Experience	7	10	3			4.2
Faculty Advising	9	10	1			4.4
Clinical Experience	9	10	1			4.4
Clinical Supervision	6	12	2			4.2
Clinical Rotations	9	10		1		4.35
Coordination of Classes	9	11				4.45

Table 4-4. Quest #3. Responses to DMS Resources at TCC.

Question Four: Rate the Tidewater Community College Learning Resource Center (LRC) in the following areas and indicate the adequacy and extent to which you used each. Graduates were asked to rate the availability of journals and periodicals, books and audio-visual aids within the LRC and rate their use of each resource. Responses are listed in Table 4-5 and table 4-6. Graduates were also asked if another area library was utilized. Seven graduates used additional medical libraries in the area in addition to the TCC library.

	LRC		Adequacy				Mean
	Excellent	Good	# of Average	Respondents Fair	Poor	Unrated	
Journals	3	6	8			3	3.75
Books	5	7	5	1		2	3.89
AV Aids							

Table 4-5 Question #4. LRC Adequacy as Rated by Respondents.

LRC	Use			
	# of Extensive	Average	Little	Unrated
	1	11	6	2

Table 4-6. Question #4. LRC Usage by Respondents.

Question five: Rate your program experience in the following areas: Graduates were asked to rate their experience in abdominal scanning, OB/GYN scanning, pediatric scanning, small parts Ultrasound, portable scans, sectional anatomy, instrumentation, physics and case reviews (general anatomy). Graduates were asked to rate these experiences based on a five point scale of excellent, good, average, fair and poor. Tabulated results are found in table 4-7.

Experience	# of Respondents					Mean
	Excellent	Good	Average	Fair	Poor	
Abdominal	13	7				4.65
OB/GYN	6	7	5	1	1	3.8
Pediatric	3	3	10	4		3.25
Small Parts	6	7	7			3.95
Portables	2	8	8	2		4
Sectional Anat.	7	8	3	2		4
Instrumentation	7	11	1	1		4.2
Physics	5	12	3			4.1
Case Reviews	8	11	1			4.35

Table 4-7. Question #5. Scanning Experience of Respondents.

Question Six: Did you sit for the certification boards? Graduates were asked to answer this in a yes or no manner. Of the twenty respondents, all twenty sat for their certification boards. Question six continued with asking the graduates to rate their preparation for the registry in the areas of anatomy and physiology, sectional anatomy, abdominal scanning, OB/GYN scanning, physics and other. Tabulated results can be found in table 4-8.

	# of Respondents					
	Excellent	Good	Average	Fair	Poor	Mean
A & P	11	7	2			4.45
Sectional Anat.	11	7	2			4.45
Abdominal	12	8				4.6
OB/GYN	10	7	3			4.35
Physics	8	7	5			4.15
Other	1	3				4.25

Table 4-8. Question #6. Registry Preparation of Respondents.

There were two unsolicited comments to question six:

- I was very well prepared for the registry.
- Great!

Question seven: Please make any suggestions you feel would improve the instructional and clinical experience. Space was provided for open ended responses from the graduates. Responses are listed below.

Responses to question seven:

- There is a need for more vascular experience such as peripheral venous exams and carotid studies.
- The only thing I can think of right now is better Ultrasound units for the lab, but that may have been taken care of. Also, more vascular work. Many employers in Washington state wanted people with vascular and even echo experience, along with ABD, OB/GYN. (But I know this would be very difficult in a one year program).

and even echo experience, along with ABD, OB/GYN. (But I know this would be very difficult in a one year program).

- Improve didactic portion of the program specific to anatomy.
- Better and more equipment for labs.
- I believe the program should be longer--possibly a two year program.
- I feel I needed more experience with normal OB/GYN because in the high risk setting you, as a student, didn't receive a whole lot of scanning time -- I feel that more time spent in a setting like Paula's would be of a greater benefit.
- Program needs to incorporate more color flow/ doppler/ vascular applications.
- Extend the program -- more time for each modality.
- More clinical instructors to work one on one with you.
- More vascular training.
- Less paperwork and reports and more hands on.
- The program may have improved in the past three years. The only disappointment for me was the lack of organization. The course info was taught very well and the instructors were very knowledgeable. Physics could be taken a little slower to help everyone understand, but I don't think physics is an easy course for anyone!
- I think TCC has an excellent program and has done well with the equipment and time allowed to work with. There is a great deal of information and I feel upon graduation I may not have known everything, but I was very well prepared.
- If possible -- more vascular experience. A lot of places want a tech with experience in vascular also.



Question eight: Would you recommend the Diagnostic Medical Sonography Program at Tidewater Community College to anyone interested in the field? Graduates were given a yes or no answer choice and space for open ended responses. Of the twenty respondents, all twenty said they would refer someone to the DMS program at TCC and none said they would not. Comments to question eight are listed below.

Comments to Question #8:

- I enjoyed the program and did very well in it. I would suggest it to anyone willing to move afterward, otherwise, no.
- I feel strongly that the program should be a two year program with more clinical time.
- Very good program -- excellent director and instructors.
- Great training for the registry -- overall I felt extremely prepared. The mock exams and case studies were excellent. Clinic experience was excellent. The rotations (rotating vs. staying at one site the entire time) are a great benefit as well as the high risk OB and pediatric rotations.
- I feel that TCC gave me a good foundation to build my Ultrasound career upon. I would highly recommend it.
- I feel that I had no problem adjusting to my first job in Ultrasound. It was just like clinical rotation, but I was being paid. The radiologists I worked for in my first job said I must have gone to a very good school. They couldn't believe I had just graduated.

### Employer Surveys

Of the thirty-two surveys graduate survey packets sent out, ten employer surveys were returned. One employer employees three graduates from TCC and another employer employs two graduates from TCC. The employer survey questioned the graduates work skills and professionalism.

Question One: Please rate our graduate's scanning skills by marking the appropriate column beside each area: Employers were asked to rate skills in the areas of abdominal scanning, OB/GYN scanning, small parts Ultrasound, Pediatric scanning and Overall timeliness on a five point scale of excellent, good, average, fair and poor. Tabulated results are found in table 4-9.

	# of Respondents						
	Excellent	Good	Average	Fair	Poor	N/A	Mean
Abdominal	5	4				1	4.56
OB/GYN	3	4				3	4.43
Small Parts	4	4				2	4.5
Pediatrics	2	5				3	4.29
Timeliness	5	4				1	4.56

Table 4-9. Employer Survey Question #1. Graduate Scanning Skills  
According to Employers.

Question one then offered a yes or no choice to the question, did our graduate's work meet your department's standards. Ten or 100 % of employers answered yes and zero % answered no.

Question one then asked for open ended comments about strengths and weaknesses observed. Comments are listed below. An additional addendum was added by one employer and can be found in Appendix F for reader review.

#### Employer Comments to Question #1:

- Non-invasive vascular work to include carotid, arterial and venous studies, excellent after one year of additional training.
- Student X is gaining more confidence every day. She is excited about scanning and the unusual pathology that we have seen lately.
- ABD & OB/GYN marks are on the "high" side of good. Small Parts, Pediatrics & Timelines are good to average representing the experience levels seen
- Student Y is gaining experience, picking up scanning speed and overcoming her fears of having more than a few patients. She tries very hard to maintain high standards of professionalism and is very eager to always help out in any way....see attached addendum in Appendix F.
- No OB/GYN done in our department...cannot rate.
- Student Z is very self motivated and eager to continually learn and increase her abilities.
- Student T is very flexible in all areas

- Student U is not only an excellent scanner but also demonstrates compassion and loving care to her patients. This quality is a "must" at our institution.

Question two: What is the employee's level of professionalism and ethics? Employers were asked to rate the graduates cooperation with co-workers, patient relationships, problem defining skills, problem solving skills, and decision making based on a five point scale of excellent, good, average, fair or poor. Table 4-10 outlines the responses received.

	# of s					
	Excellent	Good	Average	Fair	Poor	Mean
Cooperation	8	2				4.8
Patient Skills	8	2				4.8
Prob.	6	4				4.6
Prob. Solving	6	4				4.6
Decision Skills	4	6				4.4

Table 4-10. Employer Survey Question #2. Professionalism of Graduates  
According to Employers.

Question #3: How would you rate the employee's performance in the areas of orientation and adaptability? Employers were asked to rate the graduate's ability to perform the position responsibly, utilize the Ultrasound equipment, follow department routines, performs scan procedures and follow scan protocols based on a five point scale of excellent, good, average, fair and poor. Results are tabulated in table 4-11.

	# of s					
	Excellent	Good	Average	Fair	Poor	Mean
Position Resp.	10					5
Equipment	9	1				4.9
Routines	9	1				4.9
Procedures	9	1				4.9
Protocols	8	2				4.8

Table 4-11. Employer Survey Question #3. Adaptability of Graduates  
According to Employers.

Question four: If appropriate positions came open, would you employ a Tidewater Community College graduate from this program? All ten employers answered yes. Employers were given space to provide open ended answers to this question. Responses are listed below.

Comments From Employer Survey Question #4 :

- Student T came to the lab very knowledgeable of anatomy and understands Ultrasound extremely well.
- Some of your students would be an asset to the department.
- We are very satisfied with Student U's performance. If all of your students are trained as well as she, there would be no hesitation in hiring if an opening comes available.

Question five: How long has a Tidewater Community College Diagnostic Medical Sonography Graduate been employed by your facility? Employers were given four choices to chose from and responses have been tabulated in Figure 4-1.

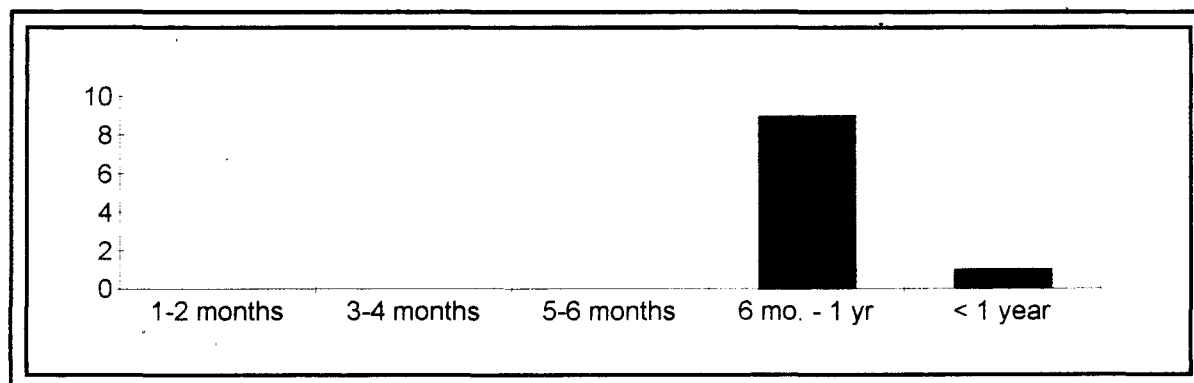


Figure 4-1. Graduate Employment Length

Question six: What would you like to see added to our program to improve the skills of our DMS graduates? Employers were given space for open ended comments to this question. Responses are listed below.

Comments to Employer Survey Question #6:

- We do an enormous amount of abdominal doppler- due to our transplant service. Some doppler would be helpful to these students, although they were all adaptable.
- Vascular training.
- The students need to pay more attention to the anatomy of the patient rather than in getting the perfect picture.
- Non-invasive vascular studies; carotid duplex scanning and peripheral arterial and venous scans.
- More scanning time...longer internship in just scanning. Maybe consider making it a 15 or 18 month program.

Question seven: Any additional comments that you believe would improve the quality of our graduates would be appreciated. Employers were given space for open ended answers to this request. Responses are listed below.

Comments from Employer Survey Question #7:

- We have 3 of your graduates! All of them were very trained--needed orienting to the department and very little else. We are very pleased with your school and the skills of your graduates.

- Ultrasound rooms are small. Students need to realize that patients hear everything! Phone calls and discussions about other patients can be misunderstood with the patient thinking they are talking about them. They need to consider how they would feel if they were the patient.

### Summary

This chapter presented the data from graduates of the DMS program at TCC and their employers. Graduates and employers were asked to evaluate performance levels of skills taught within the program and offer suggestions on tasks needed, but not covered. Responses were either open ended or given based upon a Lickert scale of five choices (excellent, good, average, fair and poor). Graduates were asked to rate their training in the field of DMS and offer suggestions for improved educational experience.

Chapter V will provide a summary of this research study, the conclusions and recommendations for future program changes based on information gained from available literature on assessment.



## CHAPTER V

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Chapter V summarizes the findings of this research study, reports the conclusions and makes recommendations regarding the research problem and goals.

#### Summary

The problem of this research study was to identify the program strengths and weaknesses of the Diagnostic Medical Sonography program at Tidewater Community College and make recommendations for program enhancements. After gathering the data required to answer the five research goals, the researcher was able to make conclusions and recommendations regarding the research problem. To refresh the reader, the research goals were:

1. Identify program strengths.
2. Identify program weaknesses.
3. Identify needs for curriculum reform.
4. Create a plan for curriculum reform implementation.
5. Implement curriculum changes through proper TCC and CAAHEP guidelines.

Information was gathered from the three most recent graduation classes of the DMS program at TCC and their current employers. Graduates and their employers were asked to rate certain performance tasks and to then provide opinions on improvements needed within the program to provide better sonographers to our community.

There were several general trends to the responses of the surveys.

They were:

- TCC graduates are well prepared for the ARDMS registry.
- TCC graduates were employed quickly after graduation.
- Employers are satisfied with TCC graduates and would hire other TCC graduates.
- Many graduates and employers see a need for vascular training to be added to the program.
- Many graduates would like to see the program lengthened.

### Conclusions

Several conclusions can be drawn from the responses returned from the surveys. Starting with the goals as defined directly in this research paper they are:

1. Identify program strengths. It is clear that TCC graduates are employed in the area with excellent or good evaluations from their employers and that all employers are pleased with TCC graduates and would hire another one if positions were available. It is also clear that the majority of our graduates have successfully passed the ARDMS registry boards. This indicates that the program is preparing students adequately, at the present time. Graduate surveys indicate that they feel well prepared for the registry and the work environment. Overall, TCC is doing a good job of preparing it's graduates.

2. Identify program weaknesses. Many of the jobs available in Ultrasound are available in Vascular labs Therefore more vascular training is needed. There are few jobs available in radiological Ultrasound at the

present time. New graduates often have to secure part-time or call positions until other positions become available.

There are great amounts of material to cover in one year. This makes the students feel rushed during their studies. Many students feel the program should be longer in length. Unfortunately, the VCCS will not approve this program at a longer length. Currently, student receive a short clinical visit in vascular Ultrasound. That could be removed totally and a career studies program in Vascular started. This could be a short program of several weeks to months with didactic and clinical training in vascular Ultrasound. The need is there, but such a program has not been started due to the difficulty in finding an instructor willing to perform those tasks on a part-time basis.

Graduates used the library little during their tenure at TCC. This may be due to the small number of references available, the difficult schedules the graduates had during their studies and is likely a combination of both. It is also likely that students were not encouraged to utilize available references enough. Resources are increased as program officials are able and an increased number of student resources have been placed in the DMS classroom for easy student access.

Graduates also note a need for more OB scanning time. Additional OB rotations continue to be actively sought by program officials, unfortunately, with little success.

3. Identify needs for curriculum reform. It is clear that primary training in Abdominal and OB/GYN scanning is good, but more vascular scanning is needed, as discussed above. The need for increased student access to reference material is evident. Recently, program funds have

been utilized to purchase new books, multimedia and other reference material which have been placed in the DMS library. Curriculum has also altered slightly and now requires more student research. This will hopefully get student to utilize the references available.

Graduates also note a need for more organized review and coverage of anatomy. Within the past two years a review of all course schedules has been completed and all courses cover anatomy on a similar schedule.

4. Create a plan for curriculum reform implementation. Scanning time is of utmost importance and if the program were lengthened at all, it would be to add additional clinical time into it. A proposal is needed to determine the feasibility of adding additional clinical time into the program as it now exists. This additional scanning time would help provide the students with additional OB and vascular scanning, which they feel weakest in. In order to accomplish this additional OB and vascular affiliates will be required. Vascular sites are available, but program officials have been unable to recruit new OB sites even though they have been actively sought over the past four years.

In order to ensure the most effective student learning, program officials must ensure all instructors cover material in the same order using the same references. A diligent effort has already begun to meet this goal by updating all course syllabi and outlines.

In order to ensure the students have been exposed to as many topics as possible and are properly prepared for the ARDMS registry, program officials must constantly expand their own knowledge within the

field of Ultrasound. All instructors are encouraged to attend continuing education seminars and educational seminars as sponsored by the VCCS and other local Ultrasound societies. widest exposure to Ultrasound topics possible.

Based on several comments, a study will have to be made into the possibility of lengthening the program. The VCCS has not been receptive, to this point, of lengthening this program to two years in length, but increasing the length by one or two months may be quite possible.

5. Implement curriculum changes through proper TCC and CAAHEP guidelines. Student want a longer program although this may not be practical given VCCS and student demands. Several graduates said a longer program would be best, but an informal survey showed that as many as fifty percent of graduates would not have attended this program is it were longer than one year in length due to financial and personal restrictions.

Vascular Ultrasound is a rapidly advancing field. Laboratories must now be accredited and that means the sonographers who work in them must be registered. It is a portion of Ultrasound with many new career opportunities in it. Students are currently given a one week vascular rotation. Not enough to make them proficient, but enough to give the students an exposure to the protocols required in scanning vascular studies. Additional weeks of vascular Ultrasound can be added to the existing program, but this will take away time from their primary scanning goals in an already crowded program. A better solution would be to add vascular Ultrasound as a career studies program with an additional period

of clinical training that will not take away from the required program constraints and could be completed after the primary program was over.

### Recommendations

The findings and conclusions of this study support the following recommendations for the DMS program at TCC:

- Continue to actively seek additional OB/GYN scanning site affiliations.
- Continue to increase Library holdings (especially those available within the DMS classroom) for student usage.
- Investigate the benefits and drawbacks of increasing program length  
(Note: This has been discussed at length before and will not likely be approved by the VCCS for funding reasons).
- Increase the Vascular rotation from one week to two or possible three weeks in length. Note: This may be added as an additional rotation after graduation to ensure maximum scanning time in area of accreditation and if successful TCC could pursue accreditation as a vascular training site also.
- Continue to monitor didactic instruction and ensure coordinated classroom lectures.
- Provide a greater emphasis on anatomy and film review to improve registry preparedness.

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## APPENDICIES

APPENDIX A. Sample Graduate Survey.

APPENDIX B. Sample Employer Survey.

APPENDIX C. Sample Graduate Cover Letter.

APPENDIX D. Sample Employer Cover Letter

APPENDIX E. Student Update Form

APPENDIX F. Employer Survey Addendum

APPENDIX G. Student Code Master List

APPENDIX A  
Sample Graduate Survey.

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# DIAGNOSTIC MEDICAL SONOGRAPHY PROGRAM

## Graduate Survey

1. In which year did you graduate? \_\_\_\_\_
2. Are you employed in Diagnostic Medical Sonography?

- |   |  |
|---|--|
| <input type="checkbox"/> YES<br><input type="checkbox"/> NO | <input type="checkbox"/> FULL-TIME<br><input type="checkbox"/> PART-TIME |
|---|--|

If YES; how long did you look for a position in Diagnostic Medical Sonography after completing the program?

- ☐ 0-2 months
- ☐ 2-4 months
- ☐ 4-6 months
- ☐ more than 6 months

If NO, why? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. Please rate the following experiences and resources in the Diagnostic Medical Sonography Program at Tidewater Community College.

	Excellent	Good	Average	Fair	Poor
Laboratory Experience					
Laboratory Equipment					
Classroom Experience					
Faculty Advising/Support					
Clinical Experience					
Clinical Supervision					
Clinical Rotations					
Coordination of class lecture & laboratory exercises					

4. Rate the Tidewater Community College Learning Resources Center (LRC) in the following areas and indicate the adequacy and extent to which you used each.

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ADEQUACY						USE		
	Excellent	Good	Average	Fair	Poor	Extensive	Average	Little
Journals/periodicals								
Books								
Audio-visuals								

If you used another library in the area, please name: \_\_\_\_\_

5. Rate your program experience in the following areas:

	Excellent	Good	Average	Fair	Poor
Abdominal scanning					
Ob/gyn scanning					
Pediatric ultrasound					
Small parts					
Portable scans					
Sectional anatomy					
Instrumentation					
Physics					
Case reviews (anatomy)					

6. Did you sit for the certification boards in Diagnostic Medical Sonography? ☐ YES ☐ NO

If so, please rate how well your courses prepared you in the following areas.

	Excellent	Good	Average	Fair	Poor
Anatomy & Physiology					
Sectional anatomy					
Abdominal scans					
Ob/gyn scans					
Physics					
Other					

7. Please make any suggestions you feel would improve the instructional and clinical experience.

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8. Would you recommend the Diagnostic Medical Sonography Program at Tidewater Community College to anyone interested in the field? ☐ YES ☐ NO

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APPENDIX B  
Sample Employer Survey.

# DIAGNOSTIC MEDICAL SONOGRAPHY PROGRAM

## Employer Survey

### QUALITY OF WORK

1. Please rate our graduate's scanning skills by marking the appropriate column beside each area:

	Excellent	Good	Average	Fair	Poor
Abdomen exam					
Ob/gyn exam					
Small parts exam					
Pediatrics exam					
Overall Timeliness					

Overall, did our graduate's work meet your department's standards?

YES ☐ NO ☐

Describe any **STRENGTHS** or **WEAKNESSES** observed.

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2. What is the employee's level of professionalism and ethics?

	Excellent	Good	Average	Fair	Poor
Cooperation with co-workers					
Relating to patients					
Defining problems					
Solving problems					
Making decisions					

3. How would you rate the employee's performance in the areas of orientation and adaptability? 37

	Excellent	Good	Average	Fair	Poor
Position responsibility					
Equipment					
Routines					
Procedures					
Protocols					

4. If appropriate positions came open, would you employ a Tidewater Community College graduate from this program?

Please explain \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. How long has the Tidewater Community College Diagnostic Medical Sonography graduate been employed by your facility?

- |                                     |  |
|-------------------------------------|--|
| <input type="checkbox"/> 1-2 months | <input type="checkbox"/> 5-6 months        |
| <input type="checkbox"/> 3-4 months | <input type="checkbox"/> 6 months - 1 year |

6. What would you like to see added to our program to improve the skills of our DMS graduates?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

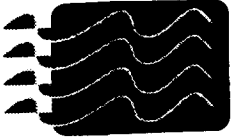
7. Any additional comments that you believe would improve the quality of our graduates would be appreciated.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



## APPENDIX C

Sample Graduate Cover Letter.



May 17, 1996

## GRADUATE AND EMPLOYER SURVEYS

Dear Graduate,

As an alumni of Tidewater Community College, you have already been surveyed about your experiences in the DMS program at least once already. In an attempt to make the program as effective as possible, I will be surveying all graduates on a yearly basis. Surveys returned will help the faculty at TCC meet the changing needs of your employers and new students within the Ultrasound community.

Please take a few minutes and complete this survey. Your input is extremely valuable to us. I am also enclosing two other forms. One form is to help keep updated graduate records and the other form is a survey for your employer. Please return the forms in the enclosed self addressed, stamped envelope.

In order to meet the needs of employers within our community, I will be surveying your employers also. I have enclosed an employer survey and a return envelope for them. Feedback from your employer can provide information on program deficiencies as well as new areas potential employers wish to see us cover within the scope of the program. This can be extremely helpful to future graduates. Please provide your employer with this survey as well as the self addressed, stamped return envelope. Please encourage your employer to complete this survey and return it by June 10, 1996. Information gathered through this process can only strengthen the sonographers who graduate from TCC in the future.

I know you are busy, but the information you will providing will be invaluable to the continued success of this program. I hope you will take a few minutes and complete and return this form by June 10, 1996. I wish you continued success in your Ultrasound career.

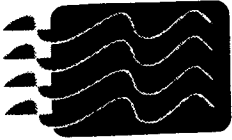
Sincerely,

Felicia M. Jones  
Director, DMS

Enc: Graduate Surveys  
Employer Surveys  
Graduate Update Sheet  
2 stamped return envelopes

## APPENDIX D

Sample Employer Cover Letter.



May 17, 1996

DAIGNOSTIC MEDICAL SONOGRAPHY EMPLOYER SURVEYS

Dear Employer,

Since a graduate from the Diagnostic Medical Sonography Program at Tidewater Community College is a member of your staff, we would appreciate you taking a few minutes to answer the enclosed questionnaire regarding that graduate's job performance. Your response will help ensure continued excellence in graduate skills. Employer feedback provides an invaluable source of information on what skills are lacking and what new skills are needed by graduates of our program. Only you, as an employer, know the specific skills required at your workplace. At TCC, we need to know if our graduates are properly trained. We can then make program modifications or add additional training to ensure that the graduates from our program are qualified to fill your department needs. All questionnaires will remain confidential.

Thank you very much for taking the time to complete this survey. Your input is extremely important to the future graduates of this program. For your convenience, I have provided a pre-addressed, stamped return envelope. Please return this survey by June 10, 1996.

Sincerely,

Felicia M. Jones  
Director, DMS

Enc: Employer Survey  
Stamped Return Envelope

APPENDIX E  
Student Update Form

Student Name \_\_\_\_\_

Name Changes \_\_\_\_\_

Current Address \_\_\_\_\_

\_\_\_\_\_

Home Phone \_\_\_\_\_

Current Employer \_\_\_\_\_

Employer Address \_\_\_\_\_

\_\_\_\_\_

Employer Phone \_\_\_\_\_

Registry Status    Y       N

If yes: Registered in what areas? \_\_\_\_\_

APPENDIX F  
Employer Survey Addendum

### Addendum to Employer Survey

Suzanne Ferree

Suzanne has been working for me around 7 months. Of all the employees that I have, she is overall the one most willing to go beyond the scope and limits of her job description. When she is not performing an Ultrasound exam, she always finds things to do to stay busy; most are essential tasks that need to be accomplished, but are ones that no one else wants to do.

Suzanne takes great pride in her Ultrasound department. Her suite is professional and organized but warm and relaxed. Her drive and desire to learn and to gain experience and knowledge is both refreshing and admirable. She studies a great deal and works with other technologists in order to gain expertise.

I would like to commend Tidewater Community College for the exemplary technologist that Suzanne is. If she is any example of the caliber of student that Tidewater turns out, I would be most pleased to hire one of them at any opportunity.

T. Sue Crews, RT-R  
Chief Technologist  
St. Mary's Outpatient Center - Chesterfield

A large, stylized handwritten signature in black ink. The signature appears to read "T. Sue Crews RT-R". The "T" is very large and loops around the "Sue". The "RT-R" is written in a cursive style at the end.



APPENDIX G  
Student Code Master List

Class 1994-1995	Key
Angela Harville	~.
Carla Gravatt	~.*
Indu Sharma	~.#
Kimberly Brubeck	#. *
Kimberly Douglas	. *
Nancy Romei	. ^.
Suzanne Ferree	.#~
Wanda Delano	!~.
Class 1993-1994	
Athena Whitridge	_*
Catherine Young	~^*
Faith Tellis	_* *
Jane Gamble	.~.
Julie Boltz	*&~
Kathryn Willis	~.#
Kimberly Moser	~.
Leslie Wilson	~*~
Mae Santos	~#~
Melissa Pyle	~_~
Patricia Hudson	~^~
Paula Wickham	*&^
Tammy Moyer	~.-
Class 1992-1993	
Alice Cesena	_*
Barbara Hathaway	^#~
Belinda Howerin	***
Cristi Green	_* *
Deborah Bolling	_*
Felicia Frame	^#_
Kristal Floyd	^#*
Lisa Jones	. *
Margarita Romero	. ^~
Robert Kondakor	^^~
Sharron Combs	^^#