The Journal of the Association of Schools and Colleges of Optometry

OPTOMETRIC EDUCATION

Volume 23, Number 3

Spring 1998

MANAGEMENT

DIAGNOSIS

ANALYSIS

KNOWLEDGE

TECHNICAL SKILLS

Clinical Performance Assessment

Association of Schools and Colleges of Optometry

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EDITORIAL

Clinical Performance Assessment

'n this year of the Winter Olympics we are reminded of the concepts and the vagaries of performance assessment. Skating judges hold up the little cards with 5.4, 5.6. 5.7. etc. How can they make such decisions? Unless the criteria they use are objective and quantifiable such as speed events that are electrically timed, then some sort of "objectivized" human judgment must be used. By its very nature, such a task is fraught with natural bias, subjectivity and other forms of human variability. When performance assessment takes place in the context of the clinical training of young doctors, the problems are no different. While there may be some aspects of performance that can be directly measured in a quantitative fashion, much of what we want to observe about a student's clinical ability is most definitely subjective. This is especially so when it comes to the most important tasks of critical thinking – diagnosis and management in optometric care.

It is appropriate, therefore, that this issue of Optometric Education presents an interesting descriptive article on the subject of clinical performance assessment. The authors Bazzinotti, Carlson and Wilson at The New England College of Optometry share with us the current status of the ongoing development of their approach. The article highlights the use of innovative clinical evaluation techniques designed to improve the level of objectivity in their clinical performance assessments. The importance of such work has been heightened over the past fifteen years during which time all of the

educational programs in optometry have moved deliberately to delivering much greater emphasis in clinical training components.

The obvious significance of constantly improving clinical assessment is to assure competence at graduation. Although clinical education is certainly an open-ended, even life-long process, during the school years it clearly must be accompanied by the concurrent comparison of student performance to milestones of achievement. These mile- stones need to measure knowledge, non-cognitive skills, cognitive skills, attitudes and other important attributes of student success within the curriculum, hopefully predicting success in professional life.

As with the Olympic judges, we are most comfortable in the testing of didactic knowledge acquisition since it is a well-established, quantifiable technique that provides "stopwatch-like" results. However, our traditional reliance upon didactic testing only provides for a logical extension of knowledge testing from the undergraduate years and does not prove there will be competence or success in the clinical years.¹²

Although it is a more difficult task, it is essential that we develop and use appropriate tools for the assessment of clinical performance. The clinical skills and attitudes required at graduation not only need to be measured to assure their achievement; these skills may only be attained when such tools are in use. As we continually re-define our performance expectations in a clinical program, we are also "benchmarking" the abilities we expect to see in our students in

comparison to the evolving practice of optometry. This process is essential to the ongoing achievement of the educational mission. It is also critical because it enables us to better budget our precious resources and tailor our preceptoral methods to best achieve the outcomes desired.

In order to make our clinical assessment paradigms work, however, we must submit them to constant scrutiny and always ask questions like: "Am I teaching what I should?" "Is the message getting through?" and "How can I innovate?" The answers to these questions are often found in the medical education literature where a variety of new concepts are reported. For example, problem-based learning, critical thinking skills inventories, competitive state anxiety inventories, and standardized patients are but a few established innovations in clinical assessment that might prove useful.

Research is the key to evaluating not only the effectiveness of a particular tool, but also to the discovery and realistic development of newer concepts. Whether an innovation we might use is new or old, whether we learn of it from the literature or develop it ourselves, it is essential that we accept the responsibility to evaluate its uses in our programs.

Felix M. Barker, II, O.D., M.S., F.A.A.O. Editor

- 1 Gomez JM et al. Clinical skills assessment with standardized patients. Medical Education 31: 94-8, 1997.
- 2. Hall J & West R. Role of formal instruction and informal practice in learning to drive. Ergonomics 39:693-706, 1996.

Looking Toward the Buture...

VA Optometry

With over 260 optometrists working in 153 medical facilities serving our Nation's 26 million veterans, VA offers more opportunities than any other health care system. Because of VA's affiliations with many schools and colleges of optometry, teaching and research opportunities are currently available in addition to direct patient care.

VA offers an outstanding opportunity for recent optometry, graduates in our residency training program, that includes areas such as hospital-based, rehabilitative, geriatric, and primary care optometry. After one year, a VA residency-trained optometrist enters the workforce confident, capable, and qualified to fulfill virtually any professional opportunity. Residency programs run for one year from July 1 to June 30.

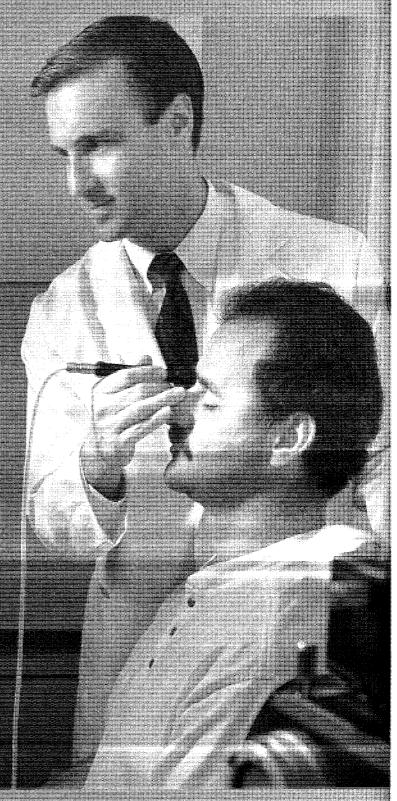
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Keeping an Bye On Our Pasta

Letters to the Editor

Where is Public Health?

I have always regarded that the Journal was an important instrument of academic optometry and of our institutional association. The recent issue (Volume 23, Number 2) contained an article by Bamberg, Grenier & Harris. I am sure that the authors did not intend to do damage to any area of the curriculum. Public and community health is an important track. In this era of managed care, and in view of the fact that we have moved as a profession much more centrally in the field of health care, I find it odd that the public health curriculum was placed in the category of "other." It is almost as though we would have placed it as an after-thought. With all due respect, it does not belong with "sports vision."

As you may know, medical education has undertaken a major initiative with the nation's schools of public health in order to generate new areas of interest, expertise and opportunities in the field of public and community health. In my respectful view, the criticality of this subject area is central to the growth and development of a health profession. Among areas of interest and concern are health services research, clinical outcomes measures, cost effectiveness and health services delivery models. Moreover, the centrality of epidemiology has never been more acute.

A prominent public health educator and a partisan and outspoken supporter of the profession of optometry was dismayed when he read the paper. His comment about public and community health in a category labeled "other" in the curriculum he felt represented an attitude that was not conducive to promoting optometry to be in the mainstream of the health sciences.

It should be added that the subject of ethics education in the curriculum did not even warrant categorical designation by the authors. This, too, is regrettable. The paper could well have been strengthened in several regards. There is still a need seriously to address education in public and community health, as well as ethics education and their placement in the curriculum for professional education in optometry.

Alden N. Haffner, O.D., Ph.D. President SUNY State College of Optometry

I read with great interest the article by Bamberg, Grenier, and Harris, and certainly there can be no disagreement as to the revolutionary change taking place in optometric education. There is no disagreement as to the overcrowded curriculum, and there is no question that some very controversial educational issues have been raised.

My areas of expertise include practice management, public health, environmental vision (part of public health) as well as history, record keeping and patient communications. I would also point out that in addition to those subjects, I am responsible for ethics being taught separately or combined in other courses.

Based on the article, for the most part all of my contribution to optometric education falls into the category of OTHER. This is truly unfortunate, as, on one hand, the author's talk about the changes brought about by managed care; and on the other hand they relegate the role of public health, ethics and etc. to the category, OTHER. It is my contention that courses such as public health and ethics help to turn out well-rounded graduates.

The authors emphasize the importance of having the student trained to function in a managed care environment, but give little thought to the fact that these students may not understand the philosophy of health care financing. Under the role of OTHER, students may be able to function in a managed care environment, but are they aware that other health professionals are involved in organizations such as PNHP, the Ad Hoc Committee to Defend Health Care, as well as their role as a member of the health care community?

As your editorial states, there are the traditional turf wars. My comments are really not concerned with a particular turf. I am, however, concerned that we may turn out a technician who can exist under managed care, but is intellectually unprepared to understand the significance of our entire health care system. These students may never be able to join the ranks of those thoughtful health care professionals who wish to reform our health care system, not just to exist in it.

As the membership chairperson for the Vision Care Section of the American Public Health Association, it has always irked me that, out of 30,000 optometrists in the United States, our membership is less than 600. This is despite constant drives for new members, resolutions and testimony by the APHA for the use of diagnostic and therapeutic drugs, and a general support of optometry by this significant health organization.

Our excuse in the past is that optometric education did not stimulate practitioners to understand the big picture in health care, and it required a great deal of postgraduate education to make them understand that they are part of that big picture.

To relegate the role of public health to OTHER continues to foster this anti-intellectual situation in the future of the profession.

Morton W. Silverman, O.D., F.A.A.O. (Diplomate Public Health) Professor, College of Optometry Nova Southeastern University

Thank you for writing regarding the paper by Bamberg, Grenier and Harris expressing concern that the content area of Public Health did not appear as a specific discipline in the curricular comparisons of the piece.

Unfortunately, the authors had to deal with the inherent limitations imposed upon them by the listing found in the 1991-92 curriculum study in order to be able to make direct comparisons between topics. I feel this was justifiable as a method of comparison (in their words "a stable platform for comparison") between this study and the previous one. I am sure the authors meant no slight to the content area of Public Health or any other area for that matter. Even with these limitations, in my judgment, the paper was still a valid presentation of curricular content issues in the schools and colleges of optometry.

In closing, I thank you again for taking the time to write about your concern that Public Health receive a more visible place in our writings. I am one who subscribes to the placement of Public Health as a discipline with high visibility in the profession of Optometry. I am sure that the appearance of your letters will do much to improve the situation.

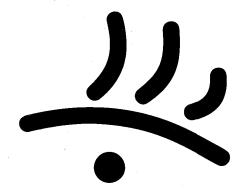
Felix M. Barker, II, O.D., M.S., F.A.A.O. Editor

Correction

In the article, "An Evaluation of U.S. Optometry School Curricula," by Bamberg, Grenier and Harris in Vol. 23, Number 2, the title on table 2 (page 45) was incorrect. The correct title is: The Percentage of Curriculum Track Hours for Each Optometry School.

Optometric Education regrets this error.

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OPHTHALMIC

INDUSTRY NEWS

Vistakon Employees Receive Johnson & Johnson Award

Johnson & Johnson has given its highest award for research and development to four Vistakon team leaders who helped develop the 1-DAY ACUVUE Daily Disposable contact lens technology. The award is the Johnson Medal for Research and Development, which recognizes individuals within the corporation whose creative science, and technology achieves a particularly profound product or process.

The recipients are: Tony Martin, vice president of research and development; Vic Lust, group manager, plastics processing; Dan Wang, group manager, technology development; and Craig Walker, group manager, design research

and development.

The four were cited for important technical contributions that enabled Vistakon to produce contact lenses at costs and in volumes sufficient to form a new category of disposable product. The success of 1-DAY ACUVUE lenses was made possible by innovations to Vistakon's manufacturing process that dramatically reduced cycle time, eliminated lengthy steps and increased the efficiency of manufacturing.

BVI Advisory Council Welcomes New Members

The Nominating Committee of VICA's Board of Directors appointed three members to the Better Vision Institute Advisory Council: optician R. Emil Hagman, optometrist Joel N. Zaba and ophthalmologist Howard S. Barnebey. Mr. Hagman and Dr. Zaba will replace Pat Tolar, FOAA, and Ron Detwiler, O.D., respectively.

Dr. Zaba has been both a practitioner and researcher, operating a practice and researching learning-related vision problems in children and adults. He has served in consultative and advisory positions for the AOA as well as for state and local organizations.

WJ Reports Sales Surge For Colored Toric Lenses

Wesley Jessen reports that 1997 sales of its colored toric lenses increased by 72%. That was on top of a similar increase in 1996, indicative of strong growth in consumer demand for these specialty lenses.

"Until this past year colored torics were an undeveloped market segment," said Patrick Tierney, Wesley Jessen's director of marketing. "In 1998 we expect them to account for 10% of total conventional toric market revenues."

Recently Wesley Jessen conducted a series of in-depth interviews with patients who had purchased colored torics. The research showed that interest in eye color change among female astigmats is just as prevalent as among patients needing sperical correction, but that some astigmats are not aware that a colored option exists.

"Often practitioners worry too much about their patients' pocketbooks and are reluctant to suggest a higher priced option," said Dwight H. Akerman, O.D., WJ's director of professional services."

Humphrey Donates Glaucoma Testing Machine to NSUCO

Humphrey Instruments donated a diagnostic machine that permits rapid and accurate testing for glaucoma to the Northeastern State University College of Optometry.

According to Dr. George Fulk, NSUCO director of glaucoma services for the College of Optometry, the Frequency Doubling Perimeter machine can test the visual field in less than two minutes per eye.

"Testing the visual field (usually) takes from 10 to 15 minutes per eye," he said. "It is an exhausting procedure and most patients hate to do it. We had some patients who simply could not complete the traditional visual test. With the FDP, patients were able to complete the test. This allowed us to make a diagnosis with confidence."

Marchon's Innovative Flexon Line Returns to Television

Marchon Eyewear, Inc., the world's largest privately owned distributor of eyewear, announced its 1998 television ad campaign for their Flexon frames. Following the extraordinary success of the fall 1997 Rock Rote advertising for Flexon, a similar campaign began in March. The national campaign will consist of advertising on national cable networks and will run high frequency during programs like ESPN's Sportscenter Sports News, CNN's Larry King Live and CNBC's Rivera Live for a period of several weeks during the prime evening, daytime and weekend hours.

Ciba Launches Focus Dailies In North America

Ciba Vision, a Novartis company, announced the North Americana launch of Focus Dailies

one-day contact lenses.

"Affordability is the key to satisfying patients who want the exceptional convenience and comfort of wearing a fresh pair of lenses every day," said Steve Schuster, president of CIBA Vision North America. "And there is no question that affordability for patients will help expand the market for daily disposables and allow them to become a mainstream modality for full-time wear."

A new patented manufacturing process developed by CIBA Vision — Lightstream Technology — enables extremely efficient production of Focus Dailies, resulting in a very affordable price.

Vistakon Leaders Attain AAO Diplomate Status

Dr. George Mertz, Vistakon director of academic affairs, and Dr. Howard Purcell, Vistakon director of professional affairs, attained Diplomate Status in the Cornea and Contact Lens Section of the American Academy of Optometry. Congratulations!

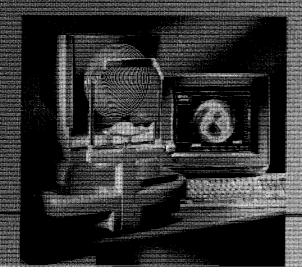
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A Comprehensive Clinical Performance Grid for Student Evaluation

Dorothy Bazzinotti Tolls, O.D. Nancy Carlson, O.D. Roger Wilson, O.D.

Introduction

he goal of any clinical program is to promote the development of professionals who can make decisions about patients' problems and manage them effectively. In order to ensure clinical competence, optometric educators must be able to assess the abilities of student clinicians using specific crite-

Assmet

A major challenge facing aptometric educotors is to provide an objective and sustematic clinical grading process that reflects the expected progression of the stuthere from early extrest time through thus nosis and management. Such a system must delineate the specific clinical skills acquired in aptometric education, minimice marichility behaves preception in the evaluation of students, and highlight the specific needs and goals of remedial climcians. This paper introduces are innavarice climical evaluation sustem which accomplishes these objections and a compreheristor clinical performance grad detailing the curricular sequencing and assessment of all Medial skills from exited technique to

KEY WORDS: clinical evaluation system, student evaluation, optometric education, clinical competence, self-assessment ria that define educational goals and objectives, enable them to apply those criteria to student performance, and identify individuals who are not meeting those criteria for both evaluative and teaching purposes.1,2 Developing a clinical evaluation system has long been regarded a difficult task, fraught with the burden of defining precisely what, in fact, constitutes a competent practitioner.^{1,3} Comprehensive Clinical Performance Grid for Student Evaluation was developed to address these concerns and provide a useful and consistent tool for student evaluation in clinical optometric education.

Issues in the Assessment of Clinical Competence

In 1988, Dell¹ discussed the development of an effective clinical evalua-

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tion system and cited the following issues: specifying short and long term goals and objectives, achieving consistency among evaluators, and assimilating a diversity of student types, clinic sites, and institutional settings. Most importantly the requirements for clinical competence must be defined. In general, competence can be defined as the degree of success achieved in providing a satisfactory solution to presenting situations.4 However, in order to assess clinical competence, it must be clearly stated in advance what students are expected to know and do. Therefore, the goal in defining clinical competency is to document the necessary skills and knowledge of the competent practitioner.1,3

Much of the literature agrees that the following components are required to achieve competency^{3,5,6}:

- technical skills and the ability to gather data,
- the ability to apply knowledge and understanding to patient care,
- problem solving and decision making, and
- interpersonal skills.

From 1992-1994 the American Optometric Association and the Association of Schools and Colleges of Optometry (ASCO) sponsored a "Summit on Optometric Education" series of conferences that addressed, in part, what was needed in the optometric curriculum to meet the entry level needs of the profession.7 A differentiation was made between the scope of the profession as a whole what an optometrist may do—and the requirements for entry level optometry-the knowledge and competencies necessary to practice safely. 8 An "outcome-based learning" approach to education was proposed in which the curriculum could be structured backwards to meet these needs.

However, few health professions have tried to link the acquisition of clinical competence year-to-year or skill-by-skill to show the continuous curriculum-based progression of knowledge and ability. This may be in part because evaluating problemsolving ability is not as objective as assessing technical skill and knowledge.5 Various methods have been designed to attempt the qualification and quantification of problem-solving skills such as patient management problems, objective structured clinical examination, national board examinations, and even computer models of clinical practice. 14.6 These methods use simulation exercises requiring numerous cognitive and problem-solving skills that are typically involved in patient examination. Unfortunately, the results and scoring among the various models are not equitable, which casts some doubt on their validity. In addition, none of them fully describe the expansive leap that students must make in their transition from technician to competent clinician.

At The New England College of Optometry (NEWENCO), much of the challenge of student evaluation lies in the diversity of the curriculum itself. The clinical program spans the second through fourth year, involves multiple preceptors, includes a variety of patient care settings ranging from the internal site at The New England Eye Institute to external sites such as community health care centers and secondary care referral centers, and encompasses three student tracks: the four-year graduate degree, the accelerated two-year degree, and the advanced placement international program.9 The College's previous attempt to reconcile these issues in an effective evaluation system resulted in the Problem Oriented Evaluation Matrix (POEM).2 This system mapped out the expected clinical development of students in matrix format. However, after several years of use, POEM was found to be limited in its ability to assimilate the complexities of the internal, external, advanced placement programs.

The problem of creating an effective student evaluation system within one institutional setting is a daunting task. Hull, et al.⁶ also stated that evaluation methods and criteria will differ substantially between institutions. In

investigating the problems of student evaluation, the authors of this paper polled nineteen schools of optometry in the United States and Canada and found this to be true. But while Dell ¹ felt that no two institutions could have identical optimal evaluation systems, it is possible to adapt the system described here to multiple and diverse institutional settings.

In the fall of 1995, NEWENCO delegated a task force to develop an innovative new system that reflects the specific skills and goals of optometric clinical education, superimposes the didactic and clinical curriculum, describes a seamless progression of clinical skill which can be adapted to all three OD degree programs, transposes easily to various clinic settings, minimizes evaluator variability by utilizing uniform grading criterion and evaluation forms, and can be adapted to scannable computer forms for statistical analysis. The result of this endeavor is the Comprehensive Clinical Performance Grid for Student Evaluation.

Premise

The many tasks involved in optometric patient care include effective history taking, visual and functional evaluation, and assessment of ocular health. According to Remington and Roggencamp⁵ "the student must be able to gather, process, and interpret data before advancing to problem solving and clinical judgment necessary to formulate a diagnosis and develop a treatment plan." Likewise, Comprehensive Clinical Performance Grid for Student Evaluation proposes that for every aspect of clinical care, the student progresses in a similar linear fashion through five levels of achievement: technical, knowledge, analysis, diagnosis, and management. (Table 1) This evaluation system is composed of three tools: the Comprehensive Clinical Performance Grid, the Expected Performance Matrix, and the Evaluation Form.

Comprehensive Clinical The Performance Grid (Table 2) details all of the necessary skills of a clinical practitioner from early learning to competency in patient care. It displays fifty tasks included in an optometric exam which are distributed in fourteen skill categories. For each of these tasks there are five levels of achievement as delineated below. The level of achievement for each skill describes the behavioral objectives through which the student progresses in order to attain clinical competence in that skill area.

The Expected Performance Matrix states how the student should progress through each category by specifying a performance level for the end of each quarter of the clinical program (see Table 3). On this matrix the levels are numbered from 1 to 5. Students will learn different skills at different points in the program and are not expected to progress at the same rate in every category. Some skills may not be applicable during certain portions of the clinical program or at specific clinic sites and are therefore denoted as "not applicable" with the number⁷. NEWENCO has different matrices for each of the three separate available programs: the four-year graduate degree, the accelerated two-year degree, and the international program. The matrices support and interface with the goals and objectives of each program's didactic curriculum.

Table 1 Trend of Clinical Progression

Level 1 Technical Skills

Can accurately and effectively perform tests involved in an optometric exam using proper technique and use of equipment and record results.

Level 2 Knowledge

Knows expected values of results and ocular function, normal clinical appearance and anatomy, and the characteristics of abnormal findings based on didactic education.

Level 3 Analysis

Integrates knowledge base with clinical findings to form differential diagnosis and pursues problem specific testing. Pursues self-study when applicable.

Level 4 Diagnosis

Makes diagnosis by correlating all exam findings with patient history and complaints and assesses prognosis.

Level 5 Management

Independently formulates a plan of action for each diagnosis including appropriate followup, treatment, and patient education.

Table 2A

Excerpt from the Comprehensive Clinical Performance Grid:
Refraction (Included but not shown: Lensometry, Keratometry, Add Determination)

REFRACTION	Level 1 Technical Skills	Level 2 Knowledge	Level 3 Analysis	Level 4 Diagnosis	Level 5 Management
- Visual Acuity	Accurately measures visual acuity at distance and near with and/or without correction utilizing proper illumination and records data properly.	Identifies expected normal findings and abnormal results. Utilizes pinhole and alternative methods for acuity measurment for children, illiterate, or non-English speaking patients.	Predicts refractive findings for sphere and cylinder correction based on visual acuity, age, and refractive status. Understands visual needs of the patient.	Able to form a dif- ferential diagnosis for etiology of reduced vision and utilizes appropriate additional tests to confirm or rule out diagnosis.	Discusses acuity with patient and impact on patient experience. Educates about further vision expections and solutions.
- Retinoscopy	Utilizes appropriate target and gives clear instructions. Converts gross findings to net.	Interprets with and against motion correctly and neutralizes each meridian. Can differentiate accommodative response from actual minus power.	Accurately measures spherical refractive error within +/50D and cyl within +/50D and axis within +/-15 degrees. Identifies refractive status.	N/A	N/A
- Subjective Refraction	Refines sphere, cyl, and axis appropriately by eliciting reliable patient response. Correlates change in power to change in acuity. Appropriately determines endpoint. Classifies and records refractive error correctly.	Knows age expected changes in refractive error for myopia, hyperopia, astigmatism. Uses correct technique for binocular balance in age appropriate patients. Can make adjustments in technique based on results when necessary, i.e., binocular refraction technique.	Determines appropriateness of Rx based on patient's visual complaints, age, and refractive status. Evaluates patient's visual needs and working distance. Considers effect of Rx change on patient lifestyle.	Considers factors affecting patient comfort and visual needs and trial frames results. Modifies tentative Rx for patient acceptance in cases of anisometropic and/or cylinder correction. Refines final Rx in trial frame to achieve satisfaction.	Issues final Rx, edu- cates patient about visual results, rec- ommends appropri- ate lens and frame material based on individual needs., e.g., children, monocular patients or sports use.
- Cycloplegic refraction	Educates patient about effect and purpose of agent and instills drops with sterile technique.	Uses cycloplegia on age appropriate patients, knows potential side effects of agent.	After accurate objective and subjective refraction compares latent refractive error to VA and symptoms.	Assesses impact of cylcoplegic refractive error on patient and trial frames tentative Rx.	Chooses appropriate Rx based on findings, educates patient about effects of Rx.

The Evaluation Form (Figure 1) lists all categories and shows a scale from 1 to 7 (except for professionalism). The scale of 1 through 5 corresponds to the progression of clinical achievement and is not a qualitative assessment of ability, i.e., 1 does not equal "poor" and 5 "excellent." As explained earlier the number 7 denotes "not applicable." The number 6 is used to indicate that a student has failed to achieve Level 1—basic technical skill. This numerical scale was developed so that the evaluation form could be adapted to scannable com-

puter form capability. A fifteenth category, Professionalism, is included that has only three levels and is discussed below. The form also includes sections for written comments and recommendations. Requirements for the grades of Honors, Pass, Remedial, Fail, and Incomplete are specified.

Trend of Clinical Progression

Outcome-based learning describes the abilities students must attain by graduation but competent professionals have to begin somewhere—at the beginning. How students achieve competency in the course of their clinical training can be described by a linear progression of ability:

LEVEL 1: TECHNICAL— The student can obtain exam data by accurately and effectively performing the tests involved in an optometric exam using proper technique and diagnostic equipment and record the results. This is the first and most basic level of the clinical exam. To achieve this level, students must perform tasks rotely and confidently.

Table 2B

Excerpt from the Comprehensive Clinical Performance Grid: Anterior Segment (Included but not shown: Lids/lashes/ocular adnexa, Conjunctiva/Sclera, Iris, Anterior Chamber, Intraocular Pressure, Diagnostic and Therapeutic Pharmaceutical Agents)

Level 1 Technical Skills	Level 2 Knowledge	Level 3 Analysis	Level 4 Diagnosis	Level 5 Management
Can utilize external observation, slit lamp technique and diagnostic agents, e.g., fluorescein, Rose Bengal, and Schirmer strips to evaluate lacrimal and meibomian function.	Knows age related expected findings and identifies abnormal results. Familiar with mechanical and systemic causes of lacrimal dysfunction and basic treatment options.	Assesses test results and pursues problem specific testing, e.g., Jones test to confirm differential diagnosis. Elicits further history and patient symptomatology.	Forms final diagnosis based on test results, history, and symptoms and correlates with mechanical or medical causes. Considers factors affecting prognosis.	Provides management plan for treatment of lacrimal dysfunction e.g. lubrication, lid hygiene, punctal occlusion or irrigation, and provides patient education.
Able to examine cornea using slit lamp with various illumination skills, e.g., slit beam, specular reflection, sclerotic scatter, parallelapiped, conical beam, transillumination, indirect illumination, and record data.	Knows corneal anatomy and can identify normal structures, normal variations and age expected changes. Knows clinical classifications of corneal pathology; e.g., defects, degenerations, and dystrophies.	Identifies abnormal findings and utilizes problem specific tests, e.g., fluorescein and Rose Bengal staining and keratometry to elicit more information. Can identify level of lesion based on slit lamp observation.	Makes definitive diagnosis based on test results, history, and symptoms. Evaluates effect of pathology on visual acuity. Considers other factors related to etiology and prognosis, e.g., systemic health or medications.	Provides appropriate management plan including follow up and education about visual risks and expectations, therapeutic management, e.g., foreign body removal and pressure patching with appropriate medications, or referral.
Able to accurately measure the angle depth with von Herrick slit lamp technique, can insert gonioscopy contact lenses with sterile technique and good patient instruction and use correct mirror to view the angle.	Knowledgeable about normal angle anatomy. Able to clearly view angle structures and identify anatomical landmarks. Can utilize primary and secondary views. Records data properly.	Correctly identifies most posterior structure as well as describing vasculature, pigmentation, and other structural variations. Links with other ocular findings, e.g., corneal deposition. Can describe iris contour.	Makes decision on viability of pupillary dilation and risk of angle closure based on test results. Diagnoses angle anomalies and potential effect on IOP as well as prognosis.	Determines appropriate management plan including monitoring, follow up, education, prophylactic laser or surgical intervention, or therapeutic management.
Can evaluate lens with slit lamp technique such as slit beam and transillumination and with ophthalmoscopy.	Knowledgeable about normal lenticular structure and genetic variants and can identify normal variations and describe abnormal findings.	Able to differentiate level of lenticular opacity and pursues further history for patient symptomatology. Can correlate with refractive findings.	Diagnoses type of cataract or lenticular opacity and its impact on visual acuity and correlates with history, symptoms. Considers factors affecting prognosis and treatment.	Discusses management options with patient and visual prognosis. Provides follow up or referral for cataract extraction.
	Can utilize external observation, slit lamp technique and diagnostic agents, e.g., fluorescein, Rose Bengal, and Schirmer strips to evaluate lacrimal and meibomian function. Able to examine cornea using slit lamp with various illumination skills, e.g., slit beam, specular reflection, sclerotic scatter, parallelapiped, conical beam, transillumination, indirect illumination, indirect illumination, and record data. Able to accurately measure the angle depth with von Herrick slit lamp technique, can insert gonioscopy contact lenses with sterile technique and good patient instruction and use correct mirror to view the angle. Can evaluate lens with slit lamp technique such as slit beam and transillumination and with	Can utilize external observation, slit lamp technique and diagnostic agents, e.g., fluorescein, Rose Bengal, and Schirmer strips to evaluate lacrimal and meibomian function. 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lent knowledge base and analytical ability but are "technically challenged"; however, without the solid technical skills to safely and accurately collect exam data the student will not be able to apply his or her knowledge to patient care. Therefore, excel-

KNOWLEDGE— LEVEL 2: Students at this level possess background knowledge about expected results for each test procedure, understand visual function and ocular anatomy, and are able to identify normal and abnormal findings. They

each test procedure and the types of processes which can affect results.

This in no way implies that clinical instruction does not include discussion of higher level analysis and case management until the student has progressed through the lower levels. It merely means that although all of these processes are involved in every patient encounter, the student should be responsible for achieving an expected level of ability by a certain time.

LEVEL 3: ANALYSIS—At this level the student begins to assess the exam data and consider the etiology of abnormal exam results. The student should formulate a differential diagnosis based on the patient's age, gender, medical and family history, symptoms, and exam data and then establish which problem specific testing to do based on the possible diagnosis. Students must also be able to integrate their background knowledge with the clinical sequelae to rule out unlikely causes for abnormal findings.

Analysis is the bridge between technicians and clinicians. It involves the early stages of problem solving which is difficult to actually measure except with behavioral specifications. The Grid clearly defines this process.

LEVEL 4: DÍAGNOSIS— The student can correlate all exam results with clinical observations and patient presentation and state a definitive diagnosis. The student is able to substantiate each diagnosis with pertinent exam findings, relate the diagnosis to any patient symptoms and consider the prognosis.

At this level students demonstrate the culmination of their skill and understanding and can now make decisions about patients' problems. The final step to independence and competency is to act on those decisions.

LEVEL 5: MANAGEMENT— For each diagnosis the student proposes a management plan which includes follow up, future testing, referral, or therapeutic treatment. The student is able to carry out potential treatment such

as certain therapeutic or mechanical procedures and effectively educate the patient on the diagnoses, prognosis, necessary treatment, and follow-up. The student also follows through on making future appointments or referring the patient to the appropriate specialist and provides referral information to other professionals.

As stated by Lewis⁸ in the "Summit on Optometric Education" series, entry level optometry means that graduates are not expected to proficiently manage every aspect of the profession. The scope of optometry includes specialty areas of practice such as vision training, low vision, and some aspects of systemic disease and therapeutic treatment that may require further training via residency programs, clinical experience, and postgraduate continuing education to achieve competency.

Table 3: Expected Performance Matrix—Four-Year Graduate Program

	ODII	ODII	ODIII	ODIII	ODIII	ODIII	ODIV	ODIV	ODIV	ODIV
	Winter	Spring	Summ	<u> Fall</u>	Winter	Spring	First_	Sec	Third	Four
Case History	1	1	2	3	3	4	4	4	5	5
Refraction	1	1	2	3	3	3	4	. 4	5	5
Functional	1	1	2	3	3	3	4	4	5	5
Neurological	7	7	1	1	1	2	3	3	4	5
Glaucoma	7	7	1	1	1	2	3	3	4	5
Anterior Segment	7	7	1	2	2	3	3	4	4	5
Posterior Segment	7	7	1	1	2	2	3	3	4	5
Systemic Disease	7	7	7	7	1	2	3	3	4	4
Contact Lens	7	7	7	1	1	2	3	3	4	5
Psychosocial	1	1	1	1	2	2	3	3	4	5
Vision Therapy	7	7	1	1	2	2	2	3	3	4
Low Vision	7	7	7	7	1	2	2	2	3	4
Ophthalmic Materials	1	2	3	3	4	4	4	5	5	5
Communication	1	1	2	2	2	3	4	4	5	5

Table 4: Professionalism

P1

The student has acted at an unacceptable professional level. This may be poor appearance, a lack of knowledge of clinic protocol, an inability to accept criticism from the preceptor, a lack of consideration for patients, preceptor, fellow clinicians, and clinic staff, or failure to follow through with patient care. A student deserves a rating of P1 if, as a result of his/her behavior, a patient is unwilling, unable, or unlikely to comply with treatment.

P2

This is the expected level of professionalism for every student throughout the clinical program. The student appears professional, is familiar with clinic protocol, and is generally considerate. The student works effectively with the patient and staff to promote optimal patient care. The student accepts criticism and modifies behavior accordingly.

P3

The student acts at an exceptional level of professionalism which maximizes patient care. This student has excellent communication skills and develops a rapport with patients that ensures compliance with treatment.

Example of an Evalu	uation Form for S	Spring Q	Figure 1 uarter, Third	Year of the Four-Ye	ar Graduate Deg	ree Program
CLINICAL EVALU				Special/Daily		Final
STUDENT:				Date:	-	
PRECEPTOR:						
CLINIC:					ts:	·
Instructions: Utilizing the student performance in denotes Not Applicable recommendations in the	each area of clinic . The expected lev	cal skill li vel of per	sted below. "G formance is hi	6" denotes failure to a ghlighted. Please ma	achieve at least lev	el 1 skill. "7"
	TKADM	F	N/A	COMMENTS:		
Case History	1 2 3 <u>4</u> 5	6	7			
Refraction	1 2 <u>3</u> 4 5	6	7			
Functional	1 2 <u>3</u> 4 5	6	7			
Neurological	1 2 3 4 5	6	7			
Glaucoma	1 2 3 4 5	6	7			
Anterior Segment	1 2 <u>3</u> 4 5	6	7			
Posterior Segment	1 2 3 4 5	6	7			
Systemic Disease	1 2 3 4 5	6	7			
Contact Lens	1 2 3 4 5	6	7			
Psychosocial	1 2 3 4 5	6	7			
Vision Therapy	1 2 3 4 5	6	7			
Low Vision	1 2 3 4 5	6	7			
Ophthalmic Materials	1 2 3 4 5	6	7			
Communication Skills	1 2 3 4 5	6	7			
Professionalism	1 2 3			4		
RECOMMENDATIONS				Pass — 70% e Remedial — 50% e	% above expected expected, no 6 50-70% expected oxpected ratings - 75% attendance	
Preceptor Signature:						

Communication and Professionalism

Student Signature: __

Arthur¹⁰ stated that "the ideal professional is characterized by standards of practice, a particular knowledge base, and other behavioral imperatives which would result in a sense of internal satisfaction and being valued by society." In the devel-

opment of this "ego ideal," students are socialized to think, act, and view themselves as professionals and in doing so, structure their goals accordingly. But how does a student learn to act like a professional?

Both Norman and Hull^{3,6} listed interpersonal skill or personal characteristics as necessary components in

attaining clinical competence. At NEWENCO these are defined by "communication" which is a skill and "professionalism" which is an attitude. Because effective communication with patients and other professionals can be learned and taught, it is listed on the Grid as a skill to which the five levels of achievement can be

applied. However, a professional demeanor must be expected of a clinician at every level in the program. The College utilizes a scale of one to three in assessing professionalism which corresponds to "unacceptable," "expected," and "outstanding" respectively (Table 4).

Evaluation Procedure

When evaluating a student, the instructor refers to the Grid and then circles the number which corresponds to the student's overall level of achievement for each category on the Evaluation Form. Because there may be many individual skills within each category, the instructor must determine which level of skill the student has achieved in the category based on how many of the specific skills the student has mastered. For example, if the student has achieved level 2 ability in all of the skills of refraction except for a single clinical behavior, the rating of level 2 may be given and the deficient skill can be discussed in the "Comments" section of the evaluation form.

Next, by referring to the Matrix, the instructor can determine whether the student is at, above, or below the expected level of proficiency for the end of the present clinical quarter. If certain tasks or categories do not apply to that particular quarter or clinic site the instructor may circle the number 7. Of the applicable categories the student must achieve a certain percentage of expected ratings in order to receive a passing grade for that quarter as shown on the evaluation form. Skills which are noted as below the expected level should be discussed in the "Comments" section and a specific remediation plan delineated in the "Recommendations" section.

Discussion and feedback are also essential components of student evaluation. The Grid helps the instructor to identify areas of deficiency based on specified criteria so that effective remediation can be initiated.

Conclusion

The development of this system has raised several new challenges. First, careful staff training and acceptance of the new procedure is imperative to the success of the system. The clinical program at NEWENCO includes affiliated external clinical faculty who may be geographically remote which limits opportunities for staff training. Fortunately, the College

conducts annual preceptor conferences.¹¹ These meetings provide a forum for the exchange of ideas among all clinical faculty and enable discussion on issues related to student education. Ongoing training and discourse on the success or limitations of the new system can be promoted in this format.

Another quandary surfaced unexpectedly while the authors were trying to superimpose the criteria of the performance grid onto the goals and objectives of the present didactic and clinical curriculum. It was found that previous goals had been unrealistic or ill-timed due to the placement of certain courses in relation to the clinical program, e.g., some skills were expected of students too soon or too late in relation to course content. The expected performance matrix can be easily adjusted to meet varying timetables; however, it may be necessary to review and revise some of the goals and objectives of the course format itself.

Lastly, the Comprehensive Clinical Performance Grid has potential application as a tool for student self-evaluation. The role of self-assessment in student evaluation is poorly documented. Arthur believes that "skill in self-evaluation is a prerequisite for continuous learning." If lifelong learning is to be a goal of optometric education as proposed by the "Summit" series", then perhaps the integration of formal student self-assessment into this evaluation system may be worthy of future consideration.

In summary, the Comprehensive Clinical Evaluation Grid for Student Evaluation is an innovative new system that enables the effective assessment of student clinicians through all phases of clinical training, identifies deficient individuals, and promotes specific remediation so that clinical competence can be ensured. This system:

- reflects the specific skills and goals of optometric clinical education,
- superimposes the didactic and clinical curriculum,
- describes a seamless progression of clinical skill from early patient care through final case management,
- can be tailored to different degree programs,
- transposes easily to various clinic settings,
- minimizes evaluator variability by utilizing uniform grading criterion and evaluation forms,
- is straightforward and easy to use, and

 can be adapted to scannable computer forms for statistical data compilation.

The system also:

- reduces the erroneous advancement of remedial clinicians,
- provides a precise measure for student self-evaluation, development, and goal setting, and
- is adaptable to other institutional settings.

The Grid encompasses College's original objectives but it also addresses many of the challenges cited in previous reports on the difficulty of student evaluation. It may need to be modified in the future to accommodate the specifications of entry level optometry versus the scope of the profession. An outcomes assessment of this system will provide more information on its success and its impact on student evaluation. The authors believe that this system will be a valuable tool for NEWENCO and beyond but recognize that it is a dynamic process which must adapt as new challenges arise in optometric education.

*Note: For more information please e-mail Dr. Bazzinotti at bazzinot@ ne-optometry.edu

References

- 1. Dell W. Clinical evaluation: issues and problems. J Optom Ed 1988; 13(4): 113-116.
- Heath D, Kurtz D, Hines C, Carlson N. Problem-oriented evaluation matrix. J Optom Ed 1988; 13(4): 117-121.
- 3. Neufield V, Norman, G. Assessing Clinical Competence. New York: Springer Publishing, 1985: 15-35.
- Marshall J. How we measure problem-solving ability. Med Ed 1983; 17: 319-324.
- Remington L, Roggencamp J. Utilizing the patient management problem as a student clinical evaluation tool. Opt Ed 1994; 3: 86-93.
- Hull A, Hoder S, Berger B, Ginsberg D, Lindheim N, Quan J, Kleinhenz M. Validity of three clinical performance assessments of internal medicine clerks. Acad Med; 70(6): 517-522.
- 7. Morris, SB. Curriculum model for optometry: outcomes of the process. Optom Ed 1994; 20(1): 15-18.
- 8. Lewis, LL. Defining the scope of practice in optometry. Opt & Vis Sci 1994; 71(2): 76-79.
- Heath D, Caruso J, Chauncey D. Developing innovative programs for unique student populations. JAOA 1994; 65(12): 865-871.
- Arthur H. Student self-evaluations: how useful? how valid? Int J Nurs Stud 1995; 32(3): 271-276.
- 11. Wilson R. Clinical preceptor conferences as a venue for total quality education. Optom Ed 1996; 3: 85-89.



A Customized TQE Program for Optometry Administrative Staff

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Abstract

A custom designed total quality education program was prepared for the administrative staff of the College of Optometry at The Oldo State University. The program consisted of four basic modules designed to enhance interpersonal skills, to develop effective communication skills, to create strategies for conflict resolution, and to identify internal and external service programs within the staff's control. Unique program features embraced use of an outside consultant, use of a social profile instrument, implementation of a "moments of truth" training module, and made fication of training based on feedback.

Tangible outcomes included development of a mission statement, staff ground rules, an analysis of team strengths and weaknesses, and personal action plans. Although the team itself reported no perceived improvement in teamwork four months following training, significant gains in customer service quality were noted by external customer groups.

KEY WORDS: Total Quality Education, social profile, customer service, teamwork

Introduction

is part of a larger philosophy of strategic quality management that states that the characteristics of quality are: meeting or exceeding customer needs; continuous improvement; leadership; human resource development; creativity within the system; fear reduction; recognition and reward; teamwork; systematic problem solving; and measurement.¹

The primary administrative personnel of schools and colleges of optometry are generally the first points of contact in the educational process. They form the staff infrastructure of the school or college that deals with everything from admissions to financial management. Without an effective administrative staff, the school or college faces the possibility of losing support from the various groups that it serves. In a sense, the persons of the administrative staff are generally the first to identify constituent needs and are an

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important component of those in the institution who can implement continuous improvement and make things happen.

With this in mind, a total quality education training program was designed for the purpose of improving customer service at the point of first contact with the College of Optometry at The Ohio State

University.

The hallmark of rendering excellent external customer service rests with the level of internal customer service given.² In other words, our interaction and service to various constituency groups (applicants, students, faculty, alumni, donors, professional groups, university personnel, general public) are only as good as our internal service systems (service to each other as a professional administrative staff). Typically, TQ programs address the external constituent group (customer) developing external customer service with little or no attention paid to the people who support that service. The program proposed here addresses internal service, an area that has been underdeveloped in optometric education. Two key purposes of this customized TQE training program were: (1)To increase service to the College's various educational constituency

various educational constituency groups through investment in development of the College's key professional educational staff.

(2) To build and enhance skills of key professional administrative staff to respond to the top five needs of every education customer.³ These needs, in priority order, are:

Reliability - accuracy/consistency Responsiveness-promptness/helpfulness

Assurance - trust

Empathy - care/attention

Tangibles - physical appearance and tools to get the job done

Another indirect related purpose was to present a staff development program *customized* specifically to them, and which could be evaluated at its completion for application to other areas of the college, such as patient care staff development and faculty development.

Target Audience:

The target audience was the professional administrative staff of The Ohio State University College of Optometry. The audience included the professional staff concerned with

admissions, counseling/student services, development, alumni relations, financial management, personnel and special projects. The dean also participated in the training program. This was especially important for promoting teamwork, establishing the importance of training (and its importance to the CEO), and improving communication between the dean and administrative staff.

Program Design

In order to custom design a training program geared to the needs of a particular group of individuals, each person was interviewed (2-3 hours per interview) by the TQE consultant (TV). The interviews provided data on work habits, attitudes, relationships, job descriptions, and values that allowed the consultant to initialize a training program with a specific content and length. Total Quality researchers generally recommend 24-32 hours of skill building training, in this case customized to skills specifically needed by optometry administrative staff to deliver excellent internal customer service. The initial program design was laid out in several modules:

- Interpersonal Skills (8 hours) This module provides a behavior-based method that enables an individual to adapt how he/she communicates based on the social style of other individuals. Individual profiles are determined by an instrument developed by Tracom⁴ (Tracom's database includes more than 600,000 profiles, and the instrument has been shown to be extremely valid). Specific objectives in this module were:
 - a) to profile the participants according to self-perception and others' perception.
 - b) to be able to observe communication behaviors and identify where behaviors fall in the social profile (analytical, driver, amiable, expressive).
 - c) to learn how to increase versatility (how to successfully communicate with other social profiles).
 - d) to be able to identify and resolve toxic relationships.
- Communication Skills (6 hours) -Effective communication skills are necessary to achieve better results from future training sessions. The successful application of every module selected for the Optometry Staff development efforts rests on the abili-

ty of participants to understand and demonstrate effective communication. Specific objectives in this module were:

- a) to increase effective communication skills that will enable participants to see immediate results in their daily interaction with fellow staff members and with constituent groups.
- b) to understand and remove verbal and non-verbal barriers to communication.
- c) to apply active listening techniques when communicating.
- d) to identify behaviors that solidify internal relationships throughout the College.
- e) to enable participants to communicate respect for others even when they may disagree or have to attend to other priorities.
- f) to review research data that give insight into communicating with people of different gender, age, values, etc.
- Resolving Conflict (4 hours) Conflict is inevitable in any educational environment. The modules covered previously should help resolve many instances of conflict. Staff members must be ready, however, to intervene appropriately when other methods fail to produce the results needed. Specific objectives in this module were:
 - a) to identify typical sources of conflict within the arena of the administrative staff's service and discuss methods for resolution.
 - b) to present a strategy for documenting, preparing for, and conducting meetings dealing with policy breaking, or disciplinary action.
- Moments of Truth (8 hours) This aspect of the TQE development program is basically a systems approach to identifying service problems within the staff's control. After a Moment of Truth is identified for one of the College's service groups (students, alumni, applicants, etc), the staff team comes together to identify and resolve any/all areas needing improvement to deliver total quality educational service (Note: a **Moment of Truth** is any contact between a supplier of service and a customer in which the customer decides whether the supplier is really customer oriented). This added training is hands-on with the staff team identifying the level of service they wish to give, analyzing the current situation with regard to targeted

goals, and devising an action plan to reach the goals.

- Final Action Plan (1 hour) Without a plan to implement the skills learned throughout the modules, 87% of the information will be lost. This session will clarify any misunderstandings of the skills learned, will measure the increase in learning that has taken place, and will develop a vehicle for accountability. Specific objectives in this module were:
 - a) to measure the progress of the training effort.
 - b) to conduct a question and answer session to resolve difficulties in implementing any of the skills learned.
 - c) to complete a final action plan that includes a method of accountability.

These specific modules and topics were selected based on initial interviews with all participants. In keeping with the customized nature of the program, however, feedback during the training sessions resulted in two modifications of the program:

- 1) The teamwork unit was expanded.
- 2) The staff ground rules that had initially been drafted were revisited.

Unique Program Features

All of the above program modules were uniquely designed to address the prime objectives of the program which were to (1) increase service to client groups through investment in the skills of the College staff and (2) to respond to the top five needs of educational clients:

- Reliability (Team building, **Moments** of **Truth**)
- Responsiveness (Interpersonal Skills, Communication, Resolving Conflict)
- Assurance (Action Plan)
- Empathy (Communication, Interpersonal Skills, Resolving Conflict)
- Tangibles (Team building, Resolving Conflict)

Unique features of the training were:

- 1) use of interpersonal skills evaluation.
- 2) use of a social profile instrument that is statistically valid.
- 3) use of an outside (outside the University) consultant with broad perspective of TQE and service to "customers."
- 4) follow-up with staff members between training sessions

- 5) use of **Moments of Truth** module to identify specific systems unique to our College.
- 6) use of hands-on training. This is not conceptual training, but skill building, accountability and hands-on practice.
- 7) modification of the training based on feedback.

Results

The program resulted in 14 training sessions spread over a 5-month period. A notebook of study materials was developed from handouts during each training session. Sessions were titled as follows:

Session 1: Producing Results with Others-Introduction

Session 2: Producing Results with Others-Social Style Profile

Session 3: Earning Social Endorsement - Versatility

Session 4: The PRO Action Plan

Session 5: The Art of Active Listening Session 6: Body Language and Self-Expression

Session 7: Team Performance

Session 8: Causes and Stages of Conflict

Session 9: Your Conflict Resolution Style

Session 10: Mastering Conflict

Session 11: Giving Constructive Feedback

Session 12: Serving Internal Customers and Moments of Truth

Session 13: Improving Our Moments of Truth

Session 14: Putting It All Together

The training was responsive to group dynamics in that the instructor modified sessions based on group needs and desires for specific information. For example, a specific session designed around giving and receiving feedback was prepared in response to staff requests to pursue and focus on this important topic.

The outcomes of the training for individuals were highly positive while highly positive outcomes for team building were less immediately obvious. A summary of training outcomes follows:

1) Ground rules - Ground rules for staff meetings were formulated at the beginning of the training and revised at the end of the training. These ground rules are listed in the Appendix. The average staff self-rating for adhering to ground rules was 4.0 (5=adhering very well; 1=adhering not well at all).

2) Social Style - Individual staff members expressed that the social style profiles were important tools in giving insight into how they are viewed by others, and as a way of understanding the different ways of communicating. Additional important concepts were:

- learning about "back-up" behaviors.
- there are no "right or wrong" social styles.
- different social styles can contribute positively to teamwork.
- that one can communicate more effectively if the other person's social style is known.
- avoiding toxic relationships.
- versatility is a key to increasing interpersonal effectiveness.
- 3) Personal Action Plans Each individual produced a personal action plan in which he or she committed to put training concepts into action. Most frequent personal action statements were:
- In communicating, I commit to lowering the other person's tension, not my own.
- I commit to active listening.
- I commit to using the other person's social style to modify my communication to make it more effective.
- I commit to be more aware of my body language and its impact on communication.
- I commit to being more proactive in resolving conflict.
- In a conflict situation, I commit to identifying the cause of the conflict rather than reacting emotionally.
- I commit to improving internal customer service by setting realistic expectations of others.
- I commit to improving internal customer service through respecting others and providing appropriate positive feedback.
- I commit to increase team effectiveness by being less judgmental.
- I commit to being more tolerant and patient.
- 4) **Teamwork** The training allowed the administrative staff to analyze its own strengths and weaknesses.

Team Strengths:

- Wide variety of skills is represented on the team.
- The administrative team has a good balance of social styles.
- The team is tolerant of others' moods.
- For the most part, team members are friendly toward one another.

• Individual members are willing to improve.

Team Weaknesses:

- Sharing of information is inadequate.
- •There is little immediate feedback (or reward/consequences) on job performance.
- Job expectations need to be clearer.
- Improvement is necessary in handling toxic relationships.
- There is a need for cross-training.
- There is need to reevaluate our perceptions of other team members.
- "Old Stuff" should be dealt with or forgotten.
- Feedback is not always immediate or given to the party involved.
- Maintenance of a professional image is inconsistent.
- Performance levels are inconsistent.

Four months following the training an evaluation form was completed by each staff member to assess teamwork. The results of the survey showed that there was no clear perception among the administrative staff that internal and external customer service had improved significantly or worsened significantly.

5) Mission Statement - Awareness of the desirability of teamwork led to the development of a draft mission statement for the administrative staff as follows: "The mission of the administrative staff of The Ohio State University College of Optometry is to provide effective and efficient customer service in the areas of student affairs, alumni affairs, development, business and fiscal operations, secretarial support, media services, and the professional environment. We strive for continual improvement of customer service and in maintaining compliance with University business ethics and standards. We strive to work as a team to cultivate a professional, friendly atmosphere with the ultimate goal of promoting a positive and credible image for the College of Optometry."

6)Staff Meetings - The training reinforced the necessity of regular staff meetings in order to provide effective communication and to solve common problems.

Conclusions

The custom designed total quality education program for optometry administrative staff proved to be very

valuable for individual team members in understanding the member's social style and in providing tools for effective communication and interaction with others. The program also provided a mechanism to derive common goals (mission statement, staff ground rules, and to prepare a personal action plan). Although individual gains and insights were immediate and evident, perceived significant improvements in teamwork and internal and external customer services were not immediately realized (perceived improvement over the course of 4 months was only +0.3 on a -5 to +5 improvement scale).

As with most training of this kind, much information was developed and presented in approximately 38 hours of "class" time. Given the commitment and willingness of each staff member toward customer service and teamwork, longer term gains in perceived customer service can be accomplished by:

- 1) continued regular staff meetings.
- 2) periodic review of topics in the TQE notebook.
- occasional visits by the consultant to review or supplement TQE material.
- 4) use of the consultant on specific occasions to facilitate staff meetings devoted to solving particular problems.
- 5) individual study of the TQE materials
- 6) commitment of each member to the personal action plan.

In spite of the perception of the administrative staff that customer service (both internal and external) had improved only slightly, external customer groups such as students and faculty have reported significant gains in service quality by the College's administrative staff.

References

- 1. Seymour DT. Causing quality in higher education. American Council on Education, Phoenix: Oryx Press, 1993.
- Zawacki and Applegate. Transforming the mature information technology organization: reorganizing and motivating people, 1995.
- 3. Parasuraman, Zeithaml and Berry. SERVQUAL: a multi-item scale for measuring customer perceptions of service quality. Light and Spring 1988.
- J Retailing, Spring, 1988.

 4. SOCIAL STYLE™ is a registered trademark of Tracom Corporation, a Reed Publishing USA Company, Suite 950, West Tower, 3773 Cherry Creek North Drive, Denver, Colorado, 80109.

Acknowledgment

The design and implementation of the training described in this report

were funded through the CIBA Vision/ASCO Total Quality Education Program.

APPENDIX

Staff Ground Rules

- When communicating a concern/problem, I will state facts, not opinions.
- I will speak about issues, not people.
- I will show respect to my co-workers and will treat them as professionals.
- I will conduct myself in a professional manner.
- I will share information when called upon to do so and when I believe it will help others to do their jobs more effectively.
- I will take responsibility for my own feelings.
- I will give feedback when issues need to be resolved and will work cooperatively toward an effective resolution.
- I will give positive recognition to my co-workers.
- I will strive for continuous improvement in my performance.
- I will commit to the principles of total quality education and to the goals of my personal action plan.

ASCO Meetings Calendar

June 1983

- 12-4 Academic Officers Meeting
 - Chicago Marriott O'Hare , Chicago, Illinois
- 23 Executive Committee (8 a.m. 12:00 p.m.)
 - Walt Disney World Dolphin Hotel, Orlando, Florida
- 23 Annual Meeting (1:00 p.m. 5:00 p.m.)
 - Walt Disney World Dolphin Flotel, Orlando, Florida
- 24 Annual Meeting (8:00 a.m.-12:00 p.m.)
 - Annual Luncheon, (12/30 p.m. 2/30 p.m.).
 - Walt Disney World Dolphin Hotel, Orlando, Florida
- 26 Sustaining Members Advisory Committee
 - Breaklast (S.a.m. = 10.90 a.m.)
 - Walt Disney World Dolphin Hotel, Orlando, Florida

Oriobe: 1998

31

- L4 Clinic Directors/Administrators SIG
 - Sheraton Montreal, Montreal, CANADA
- 30 Executive Committee Dinner and
 - Meeting (6:00 p.m. 9:00 p.m.)
 - Holiday Inn Hotel and Conference Center
 - Ferris State University, Big Rapids, Michigan
 - Board of Directors Meeting (8:00 a.m. 5:00 p.m.)
 - Holiday Inn Hotel and Conference Center
 - Ferris State University, Big Rapids, Michigan

For the most up-to-date information on ASCO meetings, contact ASCO's website at http://www.opted.org



Training School Clinic Staff

Vinita Allee Henry, O.D. Edward S. Bennett, O.D. M.S.Ed. Beth Henderson, O.D. Bruce W. Morgan, O.D.

ptometric institutions frequently become so involved with educating students that an equally important objective of providing excellent health care and satisfying service to the patient is overlooked. The dual goals of student education and patient satisfaction are in fact mutually dependent. As patients receive better care, more patients return to the practice and new patients are also recruited. When students evaluate greater numbers of patients, these students acquire more skill as care givers.

The entry point of interaction for new patients is the reception area. Although students and clinical faculty are well educated in patient care, there is a gap in the health care process when the introductory contact person is unable to effectively answer questions, make routine decisions about the patient's needs, respond positively and confidently in difficult situations and instill trust in patients regarding their care. Insufficient staff education can affect the success of promotional efforts and the overall quality of patient care. The staff person is the first to make contact with the patient and, therefore, can be a weak link in providing excellent health care and promoting the practice to the community.

Deficient staff education creates a secondary detriment to the student intern; there is a failure in the educational process if the student is not exposed to a well-trained staff and its vital role in practice building. The student should observe effective patient-staff interactions, participate in efficient staff-student exchanges and witness how quality staff training positively affects patient care and practice building.

At the clinical facility at the University of Missouri St. Louis, we have not dedicated time and effort to staff training in the past. Our proposal to Ciba Vision/Association of Schools and Colleges of Optometry (ASCO) Total Quality Education Grant Program was designed to meet the need for improved training of our clinical staff. We believed that more extensive staff training would lead to more confident and competent performance by our staff members, better care and service

for our patients and enhanced practice management and patient care skills for our students.

The Program Design

We contacted various facilitators who focus on staff training and development to determine who could conduct a program similar to our goals. We determined that the program would be conducted off site as a two-day seminar under the direction of Harriett Stein and Associates, recognized authorities in management and communications consulting. Our clinical facilities, three separate sites, were closed for two days and attendance at the seminar was mandatory for the clinical staff. This provided our staff the opportunity to spend an intensive period of time on staff training without experiencing any distractions. Several clinical instructors, in addition to many members of the school's office (non-clinical) staff, also attended the seminar.

Four specific objectives that were emphasized in this seminar were: improved telephone communication skills, enhanced patient relations, developing expertise with office fees and recall, and professional interaction with faculty, students and other staff members.

Telephone Communication Skills

An important component of effective telephone communication is the use of staff scripts for various forms of patient interactions. The script is not for the purpose of rote memorization, but to provide the staff with guidelines on proper presentation of fees, services, insurance, etc. Using scripts prevents the staff from encountering difficulty with information or possessing insufficient knowledge when addressing a particular topic. This is particularly beneficial with new staff members as it familiarizes them with office policies and procedures. For example, a script for a person wanting to know the fee for an eye examination should contain an introduction (greeting, identification of office and self, gratitude for calling), a method of gathering information (when was last eye examination and what type of examination desired), education (talk about the comprehensive care provided), express benefits (services and times offered) and a reminder to ask the caller for an appointment.

Other topics discussed were telephone intonation and proper etiquette.

Dr. Henry is a clinical associate professor and cochief of the Contact Lens Service at the University of Missouri - St. Louis, School of Optometry. Dr. Bennett is an associate professor at the University of Missouri - St. Louis, School of Optometry, and the executive director of the RGP Lens Institute. Dr. Henderson is a clinical assistant professor in the Contact Lens and Primary Care Services at the University of Missouri - St. Louis, School of Optometry. Dr. Morgan is a clinical assistant professor in the Contact Lens Service at the University of Missouri-St. Louis, School of Optometry. Drs. Henderson and Morgan practice optometry in the St. Louis area.

The importance of answering with a smile can not be overemphasized; even though callers can not see a face, they can hear the pleasant tone. Establishing communication with a positive, courteous, confident attitude and professional dialogue was also emphasized. Finally the practice building skill of turning an inquiry into a patient is important.

Enhanced Patient Relations

Some key points to enhancing the patient relationship are:

- shower patients with attention
- treat them as you would your mother
- find ways to help them
- make them feel important
- keep track of information about them
- greet them
- give compliments
- listen and show concern
- make them feel valued
- show gratitude
- be efficient with their time

Ms. Stein referred to a survey in which patients rated quality of service to be quite important; however, other important factors were concern, friend-liness and waiting time. Seminar attendees worked in small groups in an effort to improve their listening skills. We were reminded that today's patients are demanding consumers, and it is important to recognize issues important to each consumer and use that information to educate the patient on fashion, technical or health aspects depending on the individual's primary interest.

A discussion of how to manage difficult patients reminded seminar attendees to try to determine why the patient is being difficult. Could there be an underlying reason for the patient's difficult attitude, such as fatigue, fear, grief and depression from a loss of a loved one, or drug/alcohol abuse. The formula given for handling these cases was to listen, repeat the complaint and receive acknowledgment that it was heard correctly, express understanding, acknowledge feelings, explain the action you will take and thank them for bringing the problem to your attention.

Building Office Skills

It is not uncommon for patients to experience difficulty understanding their third party vision benefits and the staff needs to know and clearly communicate the specific details of the program. In addition, staff should be prepared to explain what is included in the agreement and what is not. In our practices we can not take it for granted that patients want only what is covered by their insurance. By providing patients with options on supplementing their program, a positive result can be obtained for both patient and practice. Staff should be comprehensive in their explanations, but also keep programs simple.

When presenting fees to the patient, providing a list of services and a total fee is more effective than itemizing fees. An example of a good method of presenting and collecting fees might be: "The total today including your comprehensive examination, your designer frame and your fashion color contact lenses is _____. Will that be check, cash or credit card?" If the patient then asks about paying the fee all at one time, the explanation of fees required may be given, such as "It's half today and the balance when you pick up your prescription eyewear and contact lenses."

Time management was also discussed. Staff should be making daily lists that are prioritized and work hard to accomplish these tasks. To maintain efficiency, the individual should continually ask, "What is the best use of my time right now?" In addition, methods for effective recall of patients were emphasized.

Professional Interaction with Faculty, Students and Other Staff

Several methods of professional interaction were discussed. One method included the impact of personal grooming and appearance on daily interactions. Seminar attendees evaluated their individual personality temperament and discussed the results in small group discussions. Small groups, consisting of individuals from each of four personality categories, discussed what was important for them to perform their job, how they preferred to be instructed, and how they preferred to be shown appreciation. A valuable part of this exercise was to see how fellow employees differed in how they liked to be instructed and rewarded. For example, one individual may like to have details spelled out clearly; another may want a general idea of what is to be accomplished and be allowed some flexibility to be creative. This exercise allowed co-workers to see why current methods of interaction may not be as effective as they desire. This exercise created a better understanding and cohesiveness among co-workers. It also allows supervisors to gain an appreciation of the individual differences of their employees.

All objectives were further reinforced with discussion and video sessions. During times of discussion, staff were able to ask questions, make comments, give specific situations that needed addressing and brainstorm as a group on how to improve their job performance and current office procedures. Videotapes were used to emphasize and demonstrate skills (i.e., listening, handling difficult patients, collecting fees, making appointments, etc.) and allowed the staff to observe role playing of skills learned. The improper uses of a skill were demonstrated on videotape, followed by the more effective method. An important component of the seminar was the time for small group interaction and problemsolving. It is not often that the staff from all three of our sites are able to be together to address daily procedures and problems. By working together for a longer period of time, they were able to collaborate in expressing concerns and to provide beneficial input on how to improve their current job environment.

A result of the seminar that was overlooked during the planning phase was the way it would make the staff feel valuable. Our staff were willing to learn, and the communication skills provided in this seminar appeared to increase their confidence level when handling frustrating situations. The optometry school clinic staff position is often a thankless one, with dissatisfaction coming from the patients, doctors and students. From the comments made by the staff during and following the seminar, we believe that the seminar made them feel more confident about their ability to effect change, even if only on a personal level, created a better unity among the staff, aided in correcting some procedural problems, refreshed skills which had been discontinued and made the staff feel they were valued members of the eyecare

Evaluations By Patient, Faculty and Staff

To evaluate the effectiveness of this information to the staff and its performance, we used two methods of collecting data that we believed might demonstrate areas of change and growth. A survey (See appendix 1) was distributed to patients prior to the seminar and once again following the seminar areas of the seminar and once again following the seminar areas of this performance.

inar. Unfortunately, the same patients were not surveyed before and after the seminar; therefore the effect measured was not a direct comparison. In addition, it was concluded via patient comments, that occasionally confusion existed so that the student intern's performance was evaluated and not the staff's. However, the three areas that appeared to demonstrate some need for improvement were: (1) ease of obtaining appointment when desired, (2) speed and efficiency of the registration process, and (3) the efficiency of the checkout procedure. The postseminar evaluations appeared to indicate that improvement existed in the latter two areas, although ease of obtaining an appointment remained a problem. Overall quality of service appeared to improve as a result of the seminar according to the evaluation results.

The second method of evaluation was to have the faculty evaluate staff performance before and after the seminar (Appendix 2). Fewer faculty returned the postseminar evaluations than the preseminar evaluations; however, the averages on each particular staff trait improved. The three areas that were graded the lowest prior to the seminar were communicating a positive attitude about the practice, treating

patients with respect and efficiently presenting and collecting fees. Evaluations of these traits improved after the seminar.

After attending the seminar, we felt that perhaps the best judge of staff improvement would be from staff members, as they would be acquainted with the topics discussed and be able to observe a change in their own performance. A third evaluation was given to the staff to evaluate their skills prior to and after the seminar (Appendix 3). Once again all areas evaluated showed improvement after the seminar.

The areas which staff rated the lowest prior to the seminar were communicating a positive attitude, ability to respond to questions regarding fees, conveying a smile when talking on the telephone, feeling empowered to make change where change is needed and receiving training to communicate with patients. The staff observed improvement in all surveyed skills.

It is interesting to note that patients, faculty and staff concluded that presenting and collecting fees efficiently was an area that needed improvement. Obviously this is an area that can be emphasized during future staff training sessions.

Both faculty and staff made comments on the evaluations suggesting that faculty and clinic administration might participate in similar training seminars. The benefits of this would be that faculty could refresh communication skills, provide an example to staff and students, and optimize the interaction among staff and faculty.

Ongoing Education

To ensure long-term benefits from the program, we obtained the training videotapes provided by Harriett Stein and Associates. We plan to provide the videos to current and new staff for their review. A manual based on the seminar teachings, sample scripts and optometric terminology has also been produced and made available as a day-to-day resource. Long-term changes resulting from the seminar can be evaluated and appropriately reinforced through annual faculty evaluation of staff performance.

Students will also receive benefits from the seminar by viewing the educational videos in a student course on interpersonal communication. As a result, student interns will become more effective in interacting with the staff and will be able to incorporate the

Appendix 1

Patient Questionnaire

Thank you for choosing the University of Missouri-St. Louis Center for Eye Care as your vision provider. We at the Center are continuously working to provide you with the best possible service, and today we would like to ask for your assistance. Could you please take a few minutes to complete this questionnaire and drop it off in the box at the front desk on your way out today? Your feedback will aid us in our ongoing efforts to satisfy your vision care needs. Thank you.

Please circle the appropriate number in each case:	Very Poor	Poor	Fair	Good	Excellent
Making your appointment					
1. Friendliness and efficiency of the person who took your call	1	2	3	4	5
2. Ease of getting an appointment at the time and date you desired	1	2	3	4	5
3. Ability to answer your questions or refer you to the appropriate part	y 1	2	3	4	5
4. Ease of reaching the person or department you wanted	1	2	3	4	5
At Your Exam					
1. Speed and efficiency of the registration	1	2	3	4	5
2. Courtesy and helpfulness of the front desk staff personnel	1	2	3	4	5
3. Response to questions about payment and insurance	1	2	3	4	5
4. Efficiency of checkout	1	2	3	4	5
5. Overall quality of service	1	2	3	4	5

If you have other comments regarding your visit to the clinic, please note them here.

Again, thank you for taking the time to help us serve you better.

training principles into their own future practice situations.

Depending on future funding, a follow-up course to the staff, six months to one year later, would allow staff a time period to apply the principles taught, to reemphasize principles of good communication and allow discussion pertaining to application of principles and problems encountered. In a followup course, Ms. Stein might be allowed to spend time observing the setting, so that she might be able to provide more specific feedback.

The basic principles have been set forth; now it is time to make sure they are applied and to correct current areas of deficiency. At a future visit, management and faculty could also be more involved in the seminar.

Appendix 2

Clinical Faculty Survey on Staff Performance

As part of our ongoing effort to provide high quality care for our patients, one of our objectives is to deliver courteous and efficient service at the front desk. Your feedback can assist us in more thoroughly evaluating our strengths and weaknesses. Please complete this form with your assessment of the staff's performance and place it in the box marked "Staff Evaluations" in the mail room.

Circle one:	Center for Eye Care Optometric Center		er	East St. Louis Center			
	propriate number in each case (1-5):					
Staff members at th		Very Poor	Poor	Fair	Good	Excellent	
Are courteous to patients on the phone and in person			1	2	3	4	5
Politely address misunderstandings			1	2	3	4	5
Communicate a positive attitude about the Center for Eye Care			1	2	3	4	5
Treat patients with respect			1	2	3	4	5
Efficiently present and collect fees			1	2	3	4	5
Interact professiona	lly with faculty, students, and oth	er staff members	1	2	3	4	5

Please include any other comments regarding performance that you would consider useful to be communicated to the staff at this location:

Thank you for taking time to provide us with this information.

		I٠	^
Ap	pend	XIL	J

Staff Questionnaire

Rate each phrase on a 1 to 5 scale, before the seminar and after the seminar (1=very poor, 2=poor, 3=fair, 4=good, 5=excellent)

Staff members at this Center:	Prior to seminar	After seminar
Are courteous to patients on the phone and in person		
Politely address misunderstandings		·
Communicate a positive attitude		
Treat patients with respect		
Efficiently present and collect fees		
Interact professionally with faculty, students and other staff members		
Are able to respond to questions regarding fees		
Have a smile in their voice when talking to patients		
Feel empowered to change areas they feel need change		
Receive training to communicate with patients		

Would you like to have this type of seminar again?

Personally, what did you gain most from it?

Other comments:

Development of the Pacific University College of Optometry Web Site

Lisa A. Groth, O.D. Nina M. Pasin, O.D. Robert L. Yolton, Ph.D., O.D.

11-3-1-64

A World Wide Web site was developed for Pacific University College at Optometry us peed of a stanteral thesis process. The disoriopment began with a definition of the things to walk in each by the site one in macrostic. to the creation of actual New paper. Total development time for the site was about six months of part-time work that huchaled learning the Hypertext Mark-up Language (HTML) coding language, eningilingan mas Kalarnika (marangan kalari senerces, and placing the site materials on the Pacific University hast computer, its addithout six months and spent modificing the pages, soliciting additional materiulls, and vermalance to e-mail complitions received through the site

The success of the site is indicated by the fact that there were ever 4,5(x) visitors during the first 12 months of operation. Estimates of development time required to produce the site indicate that each visit cost about \$1.90 and that maintenance costs for the second year of operation will range from about \$0.91 to \$1.30 per visit. These costs are for personnel only and do not include computer hardware or telephone line expenses.

KEY WORDS: World Vide Web, Web site, computer, Internet, optometry, education

Introduction

ne of the hottest new computer applications involves accessing the World Wide Web (WWW). Despite overloads and access problems, millions of people now use the Web via the Internet on a daily basis searching for information on subjects ranging from sex and stock prices to the latest shoe styles. Many have predicted that within a few years the Web will evolve to become a grand combination of the Yellow Pages, catalogs for most companies in the world, encyclopedias, and chat lines focusing on every topic imaginable.¹

With the rapid development of the Web, many potential students, including those interested in optometry, are beginning to inquire about educational programs electronically. Equally apparent is the need for potential patients, practicing optometrists, and even current students to have access to information about developments in optometry and optometry school programs in an immediate access format. For these reasons, two third year

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optometry students at Pacific decided to create a Web site for the College of Optometry.

This paper presents a brief discussion of the World Wide Web followed by a description of how Pacific's site was created. It also outlines some of the problems and unexpected costs associated with site development.

History of the Web

The WWW "lives" on a group of computers collectively known as the Internet.2 (See the Glossary of Internet-related Terms.^{2,3}) The Internet had its early origins during World War II when a computer system was devised to aid in the analysis of military data.45 After the war, this computer network continued to evolve due to the need for reliable communication in the event of a nuclear attack. In theory, missile sites, command centers, and other military installations could all be interconnected in a spider web configuration so that if any sites destroyed, communication would still be possible among those remaining.2,6,7

The summer of 1969 marked a turning point in the development of the Internet when four host computer sites were linked together by the Department of Defense's Advanced Research Project Agency (ARPA) to form a computer network called ARPANET. This network enabled researchers around the country to communicate with each other using the web configuration so that if one connection were disrupted, information could still get through via other web pathways.⁷

During the 1970s, the net grew into an international presence as electronic mail, file transfer, and remote log-in capabilities were implemented.⁸ As development of the ARPANET continued, it became increasingly dominated by university researchers who found it to be an extremely valuable research and communication tool.

The 1980's was also a significant decade for the evolution of the net, in part because funds were supplied by the National Science Foundation to provide many more university scientists with access to ARPANET. In 1984, the National Science Foundation networked five supercomputer centers to form a host for the network that was called NSFNET.8 By the late 1980s, essentially anyone with a computer modem could connect to this net.

Starting in 1990, several existing networks were "internetworked" to form what has now become known as the Internet. In 1991, the ban on commercial traffic was lifted, and this contributed to the Internet's explosive growth. It is impossible to determine the number of users actually on the Internet at any one time, but the number is estimated to be in the tens of millions.8,9

Perhaps a better representation of the Internet's growth is provided by considering the number of host computers that provide services on the net. This number has grown exponentially over the past thirty years.9,10 (Table 1.)

Development of the College of Optometry Web Site

With its large and international presence, the WWW is becoming the perfect vehicle to present information to a resource hungry world. Specifically, it provides an ideal way to communicate with computer literate individuals who might be interested in what is happening at Pacific University College of Optometry. For this reason, a College of Optometry Web site has been created. In designing the site, several target audiences were defined and determinations were made about what kinds of information would be of most interest to them. (Table 2.)

Based on these determinations, a multi-tiered page configuration was established. The user begins by selecting from broad topics of interest within which access more specific data is provided. The first page of the site, often referred to as the home page, contains graphics illustrating the College of Optometry building and provides menu choices for links to the sub-page sets shown on the Web site flow chart. (Figure 1.) The home page can be found at URL address: http://www.pacificu.edu/up/opt/ opt_home.html

Academic Programs

The Academic Programs page set is divided into three sections. The Curriculum and Catalog pages contain names, numbers, and descriptions of all the courses in the college curriculum. The Academic Calendar page provides the current yearly calendar of scholastic events and school holidays, and it will eventually con-

Table 1 Number of host computers serving the Internet. Host computers are those that contain information that can be viewed or down-loaded to a user's computer. 9,10

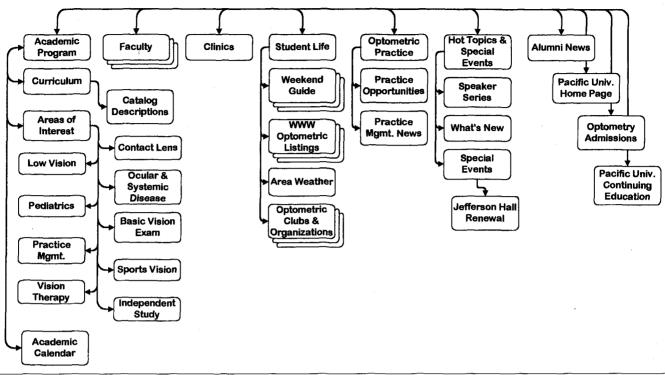
 Year	Number of Hosts
 1969	4
1984	1,024
 1989	159,000
 1992	1,136,000
1996	12,881,000

Table 2 Planning assumptions about target audiences and information needed.

Target Audience	Information Needed
Potential Students	Overview of the optometry program. Current catalog of courses. Introduction to the facilities and faculty. How to apply. Information on student activities in the area. Links to additional optometric and vision related sites. An Electronic journal describing projects done at Pacific. News items about Pacific. An e-mail directory for faculty members.
Current Students	Time tables, schedules, forms. Current catalog. Information on student activities in the area. Job wanted/available bulletin board. An Electronic journal describing projects done at Pacific. News items about Pacific. An e-mail directory for students.
Alumni and Other Optometrists	Links to continuing education pages. Alumni news. Practice management tips. New equipment reviews. Access to the alumni address list. Job wanted/available bulletin board. Links to additional optometric and vision related sites. An Electronic journal describing projects done at Pacific. News items about Pacific.
Potential Patients	Clinical services provided. Location of clinics. How to make appointments. Sense that Pacific is a "professional" health care organization. General information on the eyes and vision. Links to additional optometric and vision related sites. An Electronic journal describing projects done at Pacific. News items about Pacific.
General Visitors	General information about optometry, vision, and the eyes. Pictures and graphics related to optometry. Links to additional optometric and vision related sites. An Electronic journal describing projects done at Pacific. News items about Pacific.

Figure 1.

Block diagram of Pacific University College of Optometry Web site components.



tain projected calendars for the next four years. Access to these calendars will allow students and faculty members to plan trips, vacations, and other activities several years in advance. The third page set in this area is called Areas of Optometric Interest and contains multiple sub-pages. These subpages have been partially completed as the result of another student thesis project. When they are done, they will provide an informative, illustrated orientation to many optometric subjects including contact lenses, vision enhancement, disease management, and independent-study thesis projects being conducted at Pacific.

Faculty

Faculty members were given the opportunity to create their own Web pages containing information about their interests, qualifications, course outlines, areas of research interest, and pictures. The goal was to allow prospective students to see each faculty member as both a professional and as a "real" person to whom the students could relate. Faculty members prepared submissions and HTML coding was added as part of the thesis project.

Several faculty members created very interesting pages, but the major-

ity were reluctant to write about themselves. They indicated, however, that they would be happy to have their information included on the site if someone else would prepare their pages. Perhaps out of fear of being placed on electronic junk mail lists, a few faculty members declined to participate in the project and requested that neither their pictures nor their email addresses be shown on the site.

Clinics

Currently this section consists of basic data regarding the college clinics. Patients can find information on how to contact the various clinics and their hours of operation. In the future, this section will have maps, directions to the clinics, pictures of the facilities, and lists of services provided. Eventually, it might be possible for patients to schedule appointments and submit history information to the clinics on-line.

Student Life

This has been one of the more popular page sets. The area is sub-divided into sections on Optometric Clubs and Organizations, links to other WWW Optometric Sites, a Weekend Guide, and the Portland Weather. The Clubs

and Organizations pages give information submitted by several of the student organizations affiliated with the college. The optometric link page provides WWW links to vision care-related sites including those at other optometry schools, state and national optometric associations, and international groups. The Weekend Guide provides links to Web sites that give information on local and regional places of interest. Specific links are provided for information on local skiing conditions, wineries in the area, etc. The Portland Weather link gives an area forecast so that students and relatives who are away from campus can check on the Forest Grove weather.

This page set has been relatively easy to maintain because the optometry clubs and external sites take care of their own updates.

Optometric Practice

The Optometric Practice pages are divided into two sections. In the Practice Opportunities section, a bulletin board on which practicing optometrists can advertise openings and new graduates can post their job interests will eventually be presented. The bulletin board has been created but has not yet been implemented while several policy matters are being

resolved. In concept, the bulletin board would be fully open so that anyone visiting the Web site could post information. The open posting plan has raised issues about who would police the bulletin board for misleading or false information and how long material could be left on the board. It is expected that these issues will be resolved and that the bulletin board will become available in the near future.

The Practice Management News section features articles on managed care, practice management computer systems, and similar topics.

Alumni News

Like most schools and colleges of optometry, Pacific sends newsletters to its alumni. Because the production and distribution of these newsletters is quite expensive, in the future the newsletter could be published on the Internet. A transition period would be needed during which both paper and electronic publishing would be required, but ultimately the paper version could be phased out.

An announcement bulletin board has been implemented so that alumni can post notes about significant developments in their lives and practices. This is not an open board and information must be sent to the college for placement on the bulletin board. To date, only a few alumni have submitted material but the number should increase, as more doctors become familiar with the Web site.

Originally it was planned to have electronic access to the College alumni mailing list through this site location, but unresolved privacy issues have put this plan on hold.

Hot Topics and Special Events

This section includes three page sets. The Special Events pages provide information on the Jefferson Hall Renewal project and describe future special events. The What's New pages are designed to feature reports about new books, equipment, research, etc.

Continuing Education

This link on the College of Optometry home page takes visitors to the Pacific University Continuing Education home page. This page provides information on continuing education programs offered by Pacific and is maintained by the Continuing Education Department of the University.

Optometry Admissions

The final link on the optometry home page is to the Optometry Admissions home page which, in turn, links to the Pacific University Graduate Admissions pages. These pages provide information to prospective students on tuition, prerequisites, and application procedures. There is also a special welcome message from the Dean on these pages, which are maintained by the Admissions Office.

Implementation of the Web Site

The Web site went on-line in March 1996 following a one-month beta test during which viewing was restricted to an audience consisting primarily of faculty members and administrators. Actual implementation of the site was done by Pacific University Information Services with the Web pages currently residing on a Sun Sparc 20 host computer maintained by Information Services. At this time, all page changes must be submitted to Information Services for incorporation into the existing site. Future plans call for the site to be transferred to a computer within the College of Optometry.

To measure utilization of the Web pages, two visitor counters were inserted. One is located on the home page and counts each visitor to the site. The second counter is much deeper in the site and counts the number of visitors to a single faculty member's page. During the first 12 months of operation, over 4,500 visits (more than 12 per day) were made to the home page and over 150 visitors went deeply enough into the site to register on the faculty member's counter. In the future, more counters will be placed within the site to provide additional feedback on specific areas of interest and importance to visitors.

Site Development and Maintenance Costs

Although the Web site was created by students at minimal expense to Pacific University, estimates can be made of costs that would have been incurred had the site developers been paid. In making these estimates, it is assumed that the developers were paid \$15 per hour including fringes and that faculty members who supervised the project and contributed pages were paid \$40 per hour including fringes.

During the first 12 months of the project, the developers spent an estimated average of 24 hours per month enhancing their HTML coding skills, writing and coding pages, soliciting materials, scanning graphics, evaluating other sites, and obtaining feedback from faculty advisors. During this same period, faculty members spent an estimated average of 7 hours per month on project supervision, writing Web pages, and editing potential site materials. Based on these estimates, the total cost for site development and operation during the first year would have been about \$7,680 excluding computer hardware and telephone line charges. (Table 3) The cost per visitor can be determined by assuming that about 500 of the 4,500 visits were made during development and maintenance of the site; the remaining 4,000 visits would therefore have cost Pacific about \$1.92 each if the developers had been paid.

In addition to first year expenses, the site will have to be maintained11,12 which will involve updating calendars, making faculty page changes, soliciting additional pages, adding new features such as an electronic journal, maintaining the bulletin boards, adding new features, etc. It is estimated that the second year of site operation will require an average of 12 hours per month of staff time and an average of 5 hours per month of faculty time. If 3,500 visits are made to the site during the second year of operation, the cost per visitor would be about \$1.30; if there are 5,000 visitors, the cost would be about \$0.91 each.

To place these figures into perspective, the Pacific University Admissions Office estimates that it costs about \$3.00 to print and send an initial brochure and letter to a potential optometry student and about \$9.00 to send complete application materials including a view book and a catalog. A considerable cost savings would result if potential students could obtain this same information via the Web site.

In addition to potential students, presumably many of the site visits were made by optometrists who obtained useful information about Pacific, and by members of the public whose understanding of optometry has been enhanced as a result of their

Table 3. Costs associated with site development and maintenance.

	Estimated Student/ Staff Time and Cost for 12 Months	Estimated Faculty Time and Cost for 12 Months	Estimated Total if all Personnel Costs Paid in Cash	Estimated Number of Visitors to Site	Estimated Cost per Visitor
Development and Operation of Site for First 12 Months	24 hours per month at \$15 per hour for a total of \$4,320	7 hours per month at \$40 per hour for a total of \$3,360	\$7,680	4,500 visits counted including 500 visits made during site development. Total of 4,000 actual visitors	\$1.92
Maintenance, Further Development, and Operation of Site for Second 12 Months	12 hours per month at \$15 per hour for a total of \$2,160	5 hours per month at \$40 per hour for a total of \$2,400	\$4,560	Estimated number of visitors ranges between 3,500 and 5,000	Range between \$1.30 and \$0.91

site visit. These public relations functions of the Web site have a significant value to the college.

Future Developments

The future of the World Wide Web is uncertain only because it is difficult to predict what changes will occur in computer technology. Most people, especially those in the younger generations, are now sufficiently computer literate to use the Web, and new equipment promises easy Web access via inexpensive add-ons to television sets. Certainly there are problems with system access, search engines that return too many or too few correct hits, and network security, but these problems are only temporary. In the near future any organization that wants to make information about itself available to the public will need a Web site, and these Web sites will become highly competitive advertising devices. 12 As their sites on the Web

demonstrate, most optometry schools and colleges have already discovered the advantages of a Web site.

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References

1. Rout L, ed. The Wall Street Journal Reports: The internet (a special report). New York:

- The Wall Street Journal. Dec 9, 1996 R1-32.
- 2. Pinkowish M, ed. The physician's guide to the internet. Patient Care. 1997 31(3):26-53.
- Internet Literacy Consultants. ILC Glossary of internet terms. http://www.matisse.net/ files/glossary.html, 1997.
- Hafner K, Lyon M. Where wizards stay up late: the origins of the internet. New York: Simon and Schuster, 1996.
- 5. World Wide Web Consortium. A little history of the World Wide Web. http://www.w3.org/pub/WWW/History. html, 1997.
- Diamond E, Bates S, Horowitz M. The ancient history of the internet. Amer Heritage. 1995 46(6):34-45.
- 7. Kantrowitz B, Rogers A. The birth of the internet. Newsweek. 1994 124(6):56-8.
- 8. Pike M. Using the Internet 2nd Edition. Indianapolis: Que Corporation, 1995.
- Anonymous. Discover the New World Sprint Internet Passport. Indianapolis: Sams.net Publishing, 1997.
- 10 Zakon R.H. Hobbes' internet timeline, v2.5. http://info.isoc.org/guest/zakon/Internet /History/HIT.html, 1997.
- Sandberg J. At thousands of web sites, time stands still. New York: The Wall Street Journal. Mar 11, 1997 B1, 8.
- 12. Hall C. Firing on all Synapse. Dallas: The Dallas Morning News. Mar 23, 1997 H1-2.

Glossary of Internet-related Terms Modified from a List of Terms Provided by Internet Literacy Consultants^{2,3}

BBS (Bulletin Board System): A computerized meeting and announcement system that allows people to carry on discussions, upload and download files.

Browser: A client program (software) that is used to look at various kinds of Internet resources.

E-mail (Electronic Mail): Messages, usually text, sent from one person to another via computer. E-mail can also be sent automatically to a large number of addresses (Mailing List).

FAQ (Frequently Asked Questions): FAQs are documents that list and answer the most common questions on a particular subject.

FTP (File Transfer Protocol): A very common method of moving tiles between two Internet sites. FTP is a special way to log in to another Internet site for the purposes of retrieving and/or sending files.

Gopher: A successful method of making menus of material available over the Internet. Gopher is a Client and Server style program which requires that the user have a Gopher Client program. Although Gophers spread rapidly across the globe in only a couple of years, they have been largely supplanted by Hypertext, also known as WWW (World Wide Web). There are still thousands of Gopher Servers on the Internet and it is expected they will remain for a while.

Home Page (or Home page): Several meanings. Originally, the Web page that a browser is set to use when it starts up. The more common meaning refers to the main Web page for a business, organization, person, or simply the main page out of a collection of Web pages.

Host Any computer on a network that is a repository for services available to other computers on the network. It is quite common to have one host machine provide several services, such as WWW and USENET. HTML (Hyper Text Markup Language): The coding language used to create Hypertext documents for use on the World Wide Web. HTML looks a lot like old-fashioned typesetting code, in which a block of text is surrounded with codes that indicate how it should appear. Additionally, in HTML it is possible to specify that a block of text, or a word, is linked to another file on the Internet. HTML files are meant to be viewed using a World Wide Web Client Program, such as Netscape or Mosaic.

HTTP (Hyper Text Transport Protocol): The protocol for moving hypertext files across the Internet. This requires a HTTP client program on one end and an HTTP server program on the other end. HTTP is the most important protocol used on the World Wide Web (WWW).

Internet (Upper case I): The vast collection of inter-connected networks that all use the TCP/IP protocols and that evolved from the ARPANET of the late 60's and early 70's.

internet (Lower case i): Any time 2 or more networks are connected together, an internet results.

Intranet: A network of computers within a local area, such as a single company, that can communicate with each other and share information.

Java: Java is a new programming language invented by Sun Microsystems that is specifically designed for writing programs that can be safely downloaded to a computer through the Internet and can be immediately run without fear of viruses or other harm to your computer or files. Using small Java programs (called "Applets"), Web pages can include functions such as animation, calculators, and other fancy tricks.

Modem (MOdulator, DEModulator): A device that allows a computer to talk to other computers through the phone system. Mosaic: The first WWW browser that was available for the Macintosh, Windows, and UNIX with the same interface. Mosaic really started the popularity of the Web.

Netscape: A WWW Browser and the name of a company. The Netscape browser was originally based on the Mosaic program developed at the National Center for Supercomputing Applications (NCSA). Netscape has grown rapidly and is widely recognized as the best and most popular Web browser.

Network: If 2 or more computers are connected together so that they can share resources, a computer network is formed. If 2 or more networks are connected together, an internet is formed.

Node: Any single computer connected to a network.

Search Engine: WWW site that helps to locate other sites devoted to a specific topic. Examples include Alta Vista, Lycos, and Yahoo.

Telnet: The command and program used to log in from one internet site to another. The telnet command/program returns the log in prompt of another host.

UNIX: A computer operating system that runs on "underneath" other programs like word processors and spreadsheets. UNIX is the most common operating system for servers on the Internet.

URL (Uniform Resource Locator): The standard way to give the address of any resource on the Internet that is part of the World Wide Web.

WWW (World Wide Web): Two meanings. First, the whole constellation of resources that can be accessed using Gophers, FTP, HTTP, telnet, USENET, WAIS and some other tools. Second, the universe of hypertext servers (HTTP servers) which allow text, graphics, sound files, etc. to be mixed together.

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