The Journal of the Association of Schools and Colleges of Optometry

OPTOMETRIC EDUCATION

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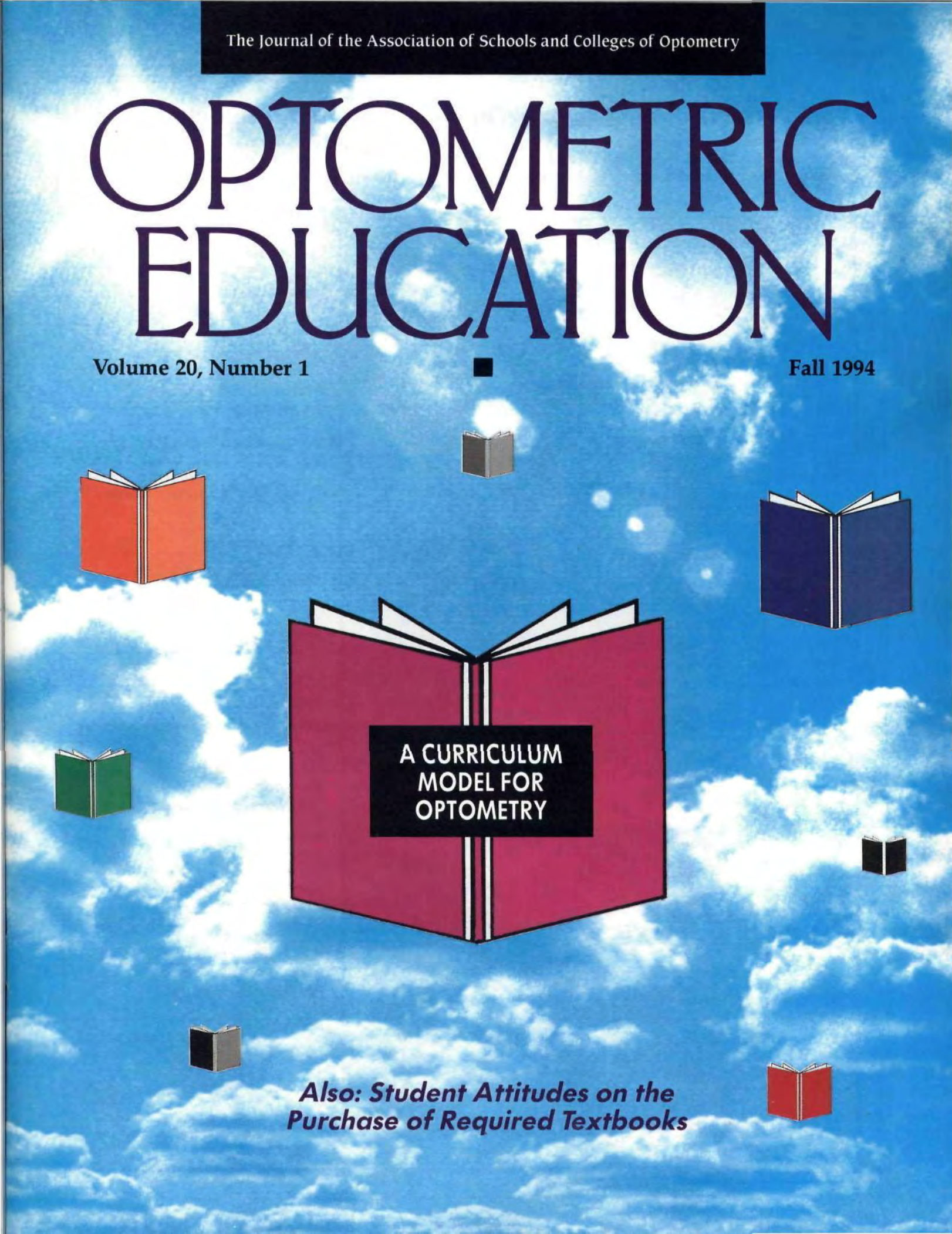

Also: Student Attitudes on the Purchase of Required Textbooks

Association of Schools and Colleges of Optometry

The Association of Schools and Colleges of Optometry (ASCO) represents the professional programs of optometric education in the United States, Canada and a number of foreign countries. ASCO is a non-profit, tax-exempt professional educational association with national headquarters in Rockville, MD.

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OPTOMETRIC EDUCATION is published by the Association of Schools and Colleges of Optometry (ASCO). **Managing Editor:** Patricia Coe O'Rourke. **Editorial Assistant:** Rebecca M. Dehbaugh. **Art Director:** Dan Hildt, Graphics in General. Business and editorial offices are located at 6110 Executive Boulevard, Suite 690, Rockville, MD 20852 (301) 231-5944. **Subscriptions:** JOE is published quarterly and distributed at no charge to dues-paying members of ASCO. Individual subscriptions are available at $20.00 per year, $25.00 per year to foreign subscribers. Postage paid for a non-profit, tax-exempt organization at Rockville, MD. Advertising rates are available upon request. OPTOMETRIC EDUCATION disclaims responsibility for opinions expressed by the authors. Article copies, 16mm microfilm, 35mm microfilm and 105mm microfiche are available through University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan 48106.

EDITORIAL

Curriculum Reform — An Ongoing Process

This special issue of Optometric Education focuses on the numerous factors, many external to the curriculum, that influence the content, form and implementation of the curriculum. Faculty, teaching strategies, outcomes assessment and societal trends are a few of these external issues discussed by the contributing authors.

Without reference to teaching methods and other external factors, curricular analysis based purely on content analyses is worrisome. The synthesis of these papers, supporting the broader view of curriculum, is, thus, reassuring. Reading them led me to realize better the current status and direction of our profession's curriculum. Currently, the process of reevaluating our educational content requirements in optometry seems particularly intense. Perhaps this is related to our rapidly evolving scope of practice and legislative posture, but other external pressures of societal reform, clinical innovation and info-technology development certainly contribute to the process of change.

All these factors lead to the conclusion that a curriculum is a complex, ever changing set of content requirements located within a format that specifies the sequence and methods of presentation, all of which are designed to lead to the accomplishment of measurable outcomes that meet societal need.

But we must also recognize that it is the faculty who are the responsible agents of the curriculum and its implementation. Additionally, it is the faculty who need to identify certain intangible factors which help to create the best learning environment within which a curriculum is implemented.

We need to know the difference between learning and teaching, and we need to effectively manage the relationship between the two. Students learn primarily by doing. Our most effective influence upon their learning, therefore, is how well we teach them to listen, study, practice and perform. In teaching, we must do more than

dispense sequential material. Dr. David Heath is accurate in his assessment that different types of material require different, sometimes unconventional, learning activities.

Dr. Pierrette Dayhaw-Barker is also correct that we need to develop a greater sense of community in our teaching and curriculum development. Individual faculty can only rarely handle every aspect of a particular subject area with effectiveness. But "team" teaching is also more than stringing together a series of lecturers. There needs to be realistic integration of material and teaching methods. All of this falls under the aegis of curriculum.

In our teaching, we need to keep the ultimate outcome of our efforts — the public's eye care needs — sharply in focus. Dr. Melvin Shipp's analysis of societal trends is on the mark, providing us not only with guidance for the political realm, but also with a most appropriate basis for targeting the outcomes of our curriculum.

Finally, the many recent efforts of our profession on behalf of curriculum development, which were outlined by Dr. Morris Berman, represent a call to action for all faculty. The Georgetown Conference highlighted clearly the continuing need for curricular reform, and the ASCO Council on Academic Affairs "dynamic data base" curriculum model provides us an extremely helpful framework within which to conduct curriculum research, design and implementation. This resource needs to be used to its fullest advantage by faculty working together in both intramural and extramural groups to extend and refine the model. Faculty input on curriculum revision needs a high priority at each of our schools and colleges, and educational research measuring the effectiveness of curriculum needs to be an ongoing process. □

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

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IN REVIEW

Vision and Aging, A.A. Rosenbloom, Jr. and Meredith W. Morgan, ed., second edition, Stoneham, MA, Butterworth-Heinemann, 1992, $69.95.

This revised edition of an accepted classic in its area expands an overall comprehensive survey of visually-related information incidental to visual and personal aging. Including the editors, some nineteen contributors combine to present fifteen different chapters. Despite this multiplicity, the composition is clear, concise, organized and readable. A minor negative criticism overall is that the chapters containing discussions within similar topical groupings did not follow each other so that chapters associated in the same topical portions of this review are found somewhat dispersed within the book. Also, since the book contains contributions from a number of authorities, a fair amount of material, which would ordinarily be combined and synthesized by a single author, is duplicated or presented among several related chapters. However, the system tends to reemphasize certain aspects by repetition, and sometimes provides the reader with individualistic emphases which can serve to supplement the information on each topic.

The objectives of the volume are best stated by the editors in their preface, "The guiding principle of this book is to provide an understanding of older individuals and their problems as an entity." The objective is further defined in the following paraphrase from the introduction, "The integration of information about, and sensitivity to, the biological, psychological and sociological determinants of function and the quality of life in old age mark the effective geriatric practitioner."

The opening chapter lays the groundwork, providing a generalized overview of the coverage. It comprises a select essay, introducing demographics, economic implications, aging of pertinent physical systems, psychological and pharmacological considerations, social issues, vision services, and legal, educational and co-management involvement.

The psychological aspects of aging, low vision and age, the problems of adaptation and compliance, and the psychological services for low-vision patients are discussed. Environmental adaptation is also considered. A most informative and valuable section listing important and useful information and initial advice to be given to the blind concludes the chapter.

The value of *Vision and Aging* as a standard textbook within our teaching institutions and to both students and educators is obvious. However, the extensive coverage and explicit clinical exposition which is included also speaks readily to the significance and usefulness of this volume as a reference and guide to the optometric practitioner who looks toward the needs of society today and in the future.

Guest Reviewer:
Dr. Irvin M. Borish
Professor Emeritus, Indiana University
Past Benedict Professor, University of Houston

Clinical Geriatric Eye Care, Sheree J. Aston, and Joseph H. Maino, Butterworth-Heinemann, Boston, 1993, 157pp. $39.95.

Clinical Geriatric Eye Care is an excellent resource for the optometric profession. The clinical relevance and practicality of this textbook, which is geared for a variety of settings ranging from private practice to homebound is most appealing. The focus is on didactic issues such as demographic statistics, geriatric pharmacology, normal and abnormal ocular aging changes, and multidisciplinary health team issues as well as practical, detailed information pertaining to building and marketing an optometric practice, history taking, low vision rehabilitation, and details for appropriate referrals. Chapters have practical suggestions on how to directly utilize the information to enhance the quality of life for our geriatric patients. The book is well organized and easily read from cover to cover. The only shortcoming noted was a tendency for certain concepts to be repeated. However, at times this was helpful for solidifying an important point.

Educators will be delighted in that this textbook is complimentary to a geriatric optometry course and will serve nicely as a required text. Practitioners will also find this book useful for its gerontology content with respect to managing the **non-visual** needs of the older adult. Additionally, the practical information on developing and marketing a practice to enhance caring for the older adult should be of great value.

Guest Reviewer:
Dr. Tanya L. Carter
SUNY College of Optometry

REQUEST FOR PROGRAMS

Optometric faculty are invited to submit computer based instruction programs for review in a new department that will be inaugurated in *Optometric Education.* Computer instruction programs will join resource reviews and abstracts as regular departments in *Optometric Education.*

Please submit the programs to:
Patricia C. O'Rourke
Association of Schools and Colleges of Optometry
6110 Executive Blvd., Suite 690
Rockville, MD 20852

Include name of program, publisher and instructions for obtaining copies.

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Minneapolis Memories

Presidents and deans, faculty members, ASCO sustaining members and invited guests met June 23-24 in Minneapolis, Minnesota, at ASCO's 53rd Annual Meeting. At the ASCO Annual Luncheon, six companies received laser-screened plaques recognizing their support as 10-year sustaining members. Pictured at the meeting are: 1. luncheon speaker, Marguerite Donoghue of the Alliance for Eye and Vision Research; 2. ASCO's 1993-1994 president, Dr. Arthur Afanador, presides at the luncheon; 3. Jim Trunick accepts an award for Allergan Inc.; 4. Dr. Sally Dillehay accepts an award for CIBA Vision Corporation; 5. Dr. Mel Wolfberg receives the award for Bausch & Lomb (also receiving awards as 10-year sustaining members, but unable to be present at the luncheon were Alcon Laboratories, Corning Incorporated and Reichert Ophthalmic Instruments); 6. Martin Wall, ASCO executive director, Dr. George Mertz, Vistakon, Lisa Wright-Solomon and Dr. Les Walls, ASCO incoming president, with a copy of ASCO's new recruitment video co-sponsored with Vistakon; 7. ASCO President Walls outlines his "new directions" vision for ASCO.

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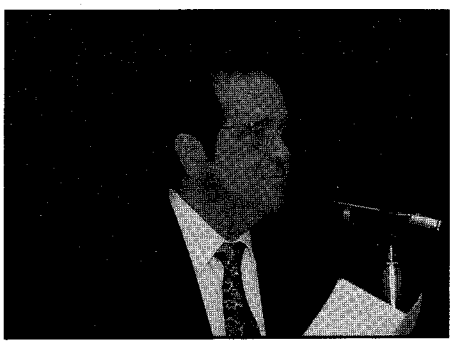

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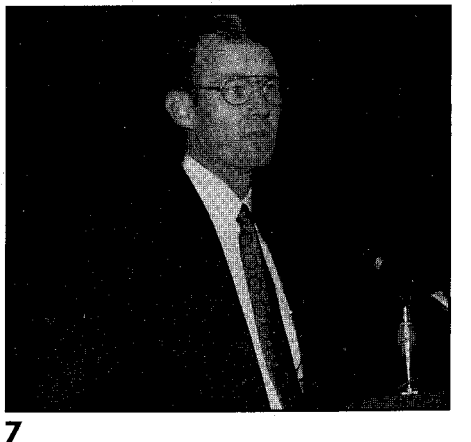

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OPHTHALMIC INDUSTRY NEWS

Companies appearing on these pages are members of ASCO's Sustaining Member Program. Sustaining Members are listed on the inside front cover of each issue. Membership is open to manufacturers and distributors of opthalmic equipment and supplies and pharmaceutical companies.

Vistakon Defends Distribution Policy

Vistakon remains committed to limiting distribution of its contact lenses to licensed eye care professionals, according to statements made by Vistakon President Gary K. Kunkle.

The announcement followed the June 28 filing of a civil suit by the Florida Attorney General against Vistakon, Bausch & Lomb and several optometrists and their professional associations alleging violations of state and federal antitrust laws and state consumer protection laws.

Kunkle said his company will continue to stand firmly behind its lens distribution policy, which states, in part, that Vistakon and its distributors will only sell Vistakon's products to optometrists, ophthalmologists, and, where allowed by law, opticians, solely for their own patients. These eye care professionals must be personally fitting contact lenses on their premises.

"This policy predates our 1988 national introduction of ACUVUE disposable contact lenses. We recognized early on that establishing strict guidelines was critical to the correct, sage use of our products and the successful growth of our brands," he said.

"Contact lenses are prescription medical devises regulated by the U.S. Food and Drug Administration. It is in our best interest and in the best interest of the patients who use our products that they be marketed only through individuals licensed to prescribe them.

"The eye care professional's ongoing involvement in contact lens wear is essential to ensure that lens prescriptions remain accurate and that patients are examined regularly for conditions that might compromise the safety of this form of vision correction," Kunkle said.

Tahran Named Vice President at Varilux

Dr. Rodney Tahran rejoins Varilux Corporation in his new position as Vice President, Professional Relations and Clinical Affairs.

Tahran's responsibilities will include developing programs for educational institutions, establishing professional relationships with associations and practitioners and initiating clinical studies from basic research to marketing projects.

"The addition of Dr. Tahran to the Professional Relations department will better service the community of independent eye care practitioners and academic groups," said R. Michael Daley, president of Varilux Corporation. "With Danne Ventura in the field as manager and Dr. Tahran heading the department, I feel we have a highly effective and influential team that will make quite an impact in the optical industry." Tahran has extensive background in the eye care industry as well as experience in both private practice and education. He received his degree from Southern California College of Optometry in 1980. A member of the American Optometric Association, he has owned his own optometry practice, served as assistant clinical professor at U.C. Berkeley since 1982 and earned a faculty appointment at Pacific University College of Optometry in 1993.

"The growth potential with the new Varilux Comfort lens and the current presbyopic market is phenomenal," Tahran said. "Comfort is so perfectly matched to the population. I believe Comfort will make a big change in the progressive lens industry based on initial clinical research and early sales figures.

"I foresee continued rapid growth, with Varilux maintaining a leadership position," said Tahran. "I'm very excited to be a part of this technological explosion."

Alcon Debuts Multi-Purpose Solution

Alcon Laboratories, Inc. recently introduced Opti-One Multi-Purpose Solution, the first detergent-free multi-purpose solution for soft (hydrophilic) contract lenses prescribed for a program of lens replacement.

As a companion product, Alcon is introducing Opti-One Rewetting Drops. Opti-One Starter Kits will be available to eye care professionals throughout the U.S. later this year.

Opti-One is designed for cleaning as well as rinsing, disinfecting and storing contact lenses — all in one solution.

"Opti-One combines these key lens care steps in a single solution and is completely detergent free," said Jack Weightman, vice president and general manager of Alcon's Vision Care Group. "This makes Opti-One especially well-suited for lenses that are frequently replaced."

The key ingredients in Opti-One are citrate, a natural cleaning agent, and Polyquad, which the company says is "a virtually non-irritating anti-microbial agent that has been proven safe and effective over seven years in millions of patients."

Wesley-Jessen and Allergan Form Alliance

Wesley-Jessen and Allergan have formed a worldwide strategic alliance to co-promote the

companies' two new products — W-J's FreshLook® disposable contact lenses and Allergan's Complete® All-In-One lens care system.

Under the five-year agreement, believed to be the most comprehensive ever established in the vision care field, W-J and Allergan will co-promote their new products through professional education, product promotion, consumer advertising, public relations, direct mail and sales force efforts.

Luxottica Adds to Sergio Tacchini Collection

Brand new from Luxottica's Sergio Tacchini collection, the 1502-S is a "sporty, stylish sunglass offering vintage appeal and first class performance," according to the company.

The modified round shape, flared keyhole bridge and unique "cut-out" metal temple design make the 1502-S a sleek, good-looking style. Lightweight zyl frame assures comfort and durability. The CR-39 lenses offer UV protection for comfort, relief and complete shielding from the harmful rays of the sun.

Red Cross Salutes Storz

The St. Louis Bi-State Chapter of the American Red Cross recently recognized Storz for its support of the relief effort during the Great Flood of 1993. Storz contributed over $25,000 to the flood relief and many Storz employees contributed countless long (and very exhausting) days and nights helping to sandbag homes, businesses, churches and communities. Several food/supply donations were also sponsored by Storz employees. Don Gaines, Storz President, reported, "Storz employees and their families fared quite well through the rain and flooding, and we're very proud of our employees' efforts to help those in the community who were less fortunate."

American Cyanamid, parent company of Storz, presented a corporate contribution totalling $60,000 to the St. Louis Chapter and the Hannibal Chapter of the American Red Cross. Cyanamid's Lederle-Praxis Biologicals donated 10,000 doses of its Tetanus and Diphtheria Toxoids vaccine to assist victims of the floods and those assisting in the relief efforts.

Polymer Supports Guide Dog Foundation

Polymer Technology Corporation and the Guide Dog Foundation For the Blind, Inc.® in Smithtown, NY, recently presented Gary Pizzolo, a licensed massage therapist living in the Bronx, NY, with his new guide dog. Through the Solutions For Sight program, PTC makes donations to the Foundation based on the sales of PTC's Boston Advance® and Original Boston® Care Systems for gas permeable lens wearers. To date, PTC has donated more than $45,000 to the Foundation to sponsor 11 guide dogs. PTC names the dogs that are sponsored and follows their progress from training through graduation.

Humphrey Chosen For Hypertension Study

The Humphrey Field Analyzer has been selected as the official perimeter for the Ocular Hypertension Treatment Study, a project of the National Eye Institute of the National Institutes of Health.

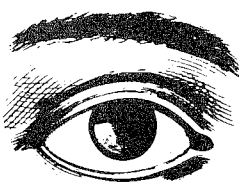
In the study, a total of 1,500 ocular hypertensive patients will be observed in 21 medical centers to determine whether early medical intervention is effective in preventing or delaying glaucomatous damage.

Ocular hypertension occurs in three to eight percent of the population over age 40 in the United States. Some 1.5 million of these glaucoma suspects are receiving hypotensive medications even though efficacy of the treatment has not been proven.

Alcon Launches Educational Program With Sjogren's Syndrome Foundations

Alcon Laboratories, Inc. has awarded grants to both the National Sjogren's Syndrome Association (NSSA) and the Sjogren's Syndrome Foundation Inc. (SSF) as part of their expanded efforts to educate patients and physicians on the importance of correct diagnosis and treatment of dry eye syndrome, especially in those patients with contributing conditions, such as Sjogren's, where dry eye symptoms may be overlooked. These educational grants help to underwrite a national education awareness program that strives to: increase public and medical awareness of Sjogren's syndrome; improve diagnosis and treatment; stimulate new research to identify the cause of and possible cure for Sjogren's syndrome; and to provide support and educational materials for Sjogren's syndrome patients, support groups and health care personnel. Alcon has supported these organizations for the last three year.

For more information, contact Stacy Howmann at (714) 851-9563 or Dave Hinchey at (817) 551-6832.



Corning's Dispensing Guide Wins Design Award

The 1993 Superb Printing Contest sponsored by the Buffalo Club Printing House Craftsmen was held recently and a First Place Gold Award was awarded to Corning Optical Products for design.

Corning won this prestigious award as Best of Category for printed manuals for its Dispensing Guide. The guide was submitted for the contest by Manhardt-Alexander, Inc. who produced the 1993 Dispensing Guide under the direction of Corning's Senior Sales Specialist, Grace A. Caracci.

Corning's Dispensing Guide is one of the most popular of the merchandising materials provided by Corning free-of-charge to dispensers.

Lesley L. Walls, O.D., M.D.

Lesley L. Walls, O.D., M.D., began a one-year term as ASCO's president in June 1994. Dr. Walls is the dean of Pacific University College of Optometry. He previously served as dean of the Northeastern State University College of Optometry from 1987-1992. Dr. Walls received his O.D. degree from the University of California at Berkeley, his M.D. degree from the University of California at Davis and completed a three-year Family Practice Residency Program at Akron General Medical Center, Akron, Ohio. He served as residency program director, department chair and associate dean of the University of Oklahoma Health Sciences Center in Tulsa. He is a board member of the National Board of Examiners in Optometry. Dr. Walls was recently interviewed by Patricia Coe O'Rourke, managing editor of Optometric Education.

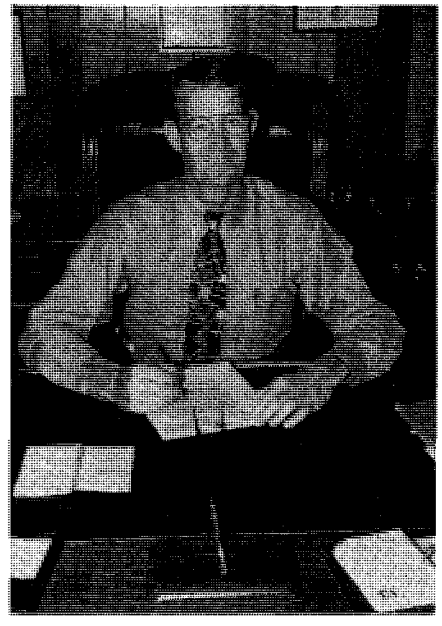
Dr. Walls, as you begin your term as ASCO's president, what goals have you set for yourself and for the Association?

I have chosen the theme "new directions" for my year as president of ASCO. The groundwork for this theme was set in the new strategic plan that ASCO's Board of Directors adopted at its June 1994 meeting in Minneapolis, Minnesota. I plan to begin the implementation of the plan by working through ASCO's committees to achieve the strategic objectives set forth in the areas of human resource development, curricula enrichment, student recruitment and financial aid, inter-institutional communication, resource development, continuing professional education, information services, government affairs and association governance and organization.

I look forward to being involved in implementing the recommendations of the AOA/ASCO Education Summit Series, especially the recommendations on curriculum. I will help to steer ASCO through the ongoing changes in the accreditation process. I plan to continue to develop the excellent relationships we have with the American Optometric Association and with industry.

Finally, I hope to balance the hard work accomplished during the regular ASCO Board meetings with more time for relaxation where the informal "business" can be accomplished. Spouses and guests will be invited to attend and professional camaraderie will be encouraged!

How do you see the schools and colleges of optometry exercising leadership at this time in the profession's development?



I know that I am in the profession best suited to me, my first love — optometry.

It is critical for ASCO to be a leader during this time of health care reform. We must address the issues and make recommendations that will positively affect the schools and colleges of optometry. ASCO must also be a leader in the issues flowing from the rapidly expanding scope of optometric practice and its effects on the curriculum, the budget and the requirements for faculty.

You have had an unusual career. How did you decide to pursue an O.D. degree and an M.D. degree?

I am an optometrist by choice, in fact, by first choice! I never thought I would wind up in academia, and being a dean was not in my wildest dream. However, I promised myself that if I ever did teach, it would be in optometry, and that I would do a better job than the few physicians who taught me in optometry school. I never felt they understood the profession of optometry.

My wife, Mary Ann, also is an optometrist. She and I wanted to live in a small town, and we felt that both of us being optometrists would not work too well. I felt that I might like to be a general medical practitioner. So I went to medical school and did practice family medicine full-time or part-time for about 20 years.

Why did you decide to go into optometric education rather than practice?

I missed academia so I left medical practice to work at a medical school in Oklahoma. While on the faculty at the medical school, I became aware of the development of a new college of optometry in Oklahoma. I visited the leadership there, and the next thing I knew, I left academic medicine and joined the faculty of the new college of optometry in Tahlequah.

I left optometry when I was offered

a position as professor and chairman of the Department of Family Practice at the University of Oklahoma College of Medicine-Tulsa, where I served for six years.

During my time there, I realized that my long-term goal was to be a dean of a college of optometry, and I made a personal commitment to return at the first opportunity and work the last twenty or so years of my career in optometry. In 1987 that was made possible when I was selected as dean of the College of Optometry at Northeastern State University. I served as dean until 1992 when I moved to the Pacific University College of Optometry in Forest Grove, Oregon, as the dean. I know that I am in the profession best suited to me, my first love — optometry.

Who have been your mentors in optometry?

My wife is a superb optometrist and was one year ahead of me in optometry school. She practices low vision, and she has encouraged and motivated me to carve out a career in academic optometry.

Two other people who influenced me and motivated me to be the best professional that I could regardless of career choice were Dr. Meredith Morgan and Dr. Hank Peters. They were wonderful role models and encouraged me greatly during my optometric career. I still see them at meetings around the country and enjoy visiting with them whenever possible. Dr. Hank Peters was, in fact, best man at my wedding in 1967!

As dean, what have been your priorities at Pacific University College of Optometry and Northeastern State University College of Optometry?

I have had the unbelievable opportunity to serve as dean of two colleges of optometry. In both instances, my priorities were to inspire students to be professional and ethical in all aspects of their lives, to advance the scope of optometric practice as quickly as is possible in all 50 states and to serve as a role model in that expansion.

I have also fought to maintain all the traditional aspects of optometry, i.e., dispensing, vision training, etc., while encouraging optometry's expansion to lasers and pathology. Every day at work I am thankful that I am in optometry and that I am doing what I really want to do as a first career choice.

Curriculum Conference Follow-up Implementing Reform

In July 1992, faculty and educational leaders from around the country converged on Denver, Colorado for three days of meetings to develop an outcomes based education model for the four-year doctor of optometry degree. Over the ensuing two years, additional work occurred, and the first version of a curriculum model data base was delivered in June 1994 to each of the schools and colleges of optometry.

In this issue of *Optometric Education*, a series of four articles is presented as a follow-up to that conference. The first article, "Curriculum Model for Optometry — Outcomes of the Process," authored by Morris S. Berman, O.D., M.S., provides an overview of the development process and an updating of the outcomes of the conference. Through the three articles following, David A. Heath, O.D., Ed.M., Melvin D. Shipp, O.D., M.P.H., and Pierrette Dayhaw-Barker, Ph.D., examine the challenges of curriculum reform in terms of pedagogy, scientific and sociopolitical trends and faculty, respectively.

The challenge of curriculum reform implementation is complex, and its resolution is critical to the future of optometric education and the profession.

■

Curriculum Model for Optometry

Outcomes of the Process

Morris S. Berman, O.D., M.S.

Optometry schools and colleges have, as their educational mission, the responsibility of training students to become primary eye care providers. This task is indeed complex and must be undertaken in a manner consistent with changing societal and biomedical variables which include public policy, economic considerations, technological advances, evolving health delivery systems, improved understanding of disease management, and the public's expectation of quality vision care. The changes will affect how the faculty modify the curriculum of the optometry schools and colleges within the constraints of a four-year training period.

The optometric profession has grown drastically during the past twenty-five years from a more narrowly defined scope of managing the healthy eye to an independent, health and vision care provider. The enactment of legislation, starting with the first optometry diagnostic drug bill in 1971 in Rhode Island, mushroomed to include all 50 states by 1989.[1] By 1994, it had expanded to include therapeutic pharmacological agents in 40 states. While the entire profession was instrumental in these changes and supported them, it was left to the optometric educators to develop programs for professional students and practicing optometrists which would fully prepare them to meet the new parameters of practice that were ushered in with the passage of diagnostic and therapeutic pharmacological legislation.

It was against this background that individual schools and colleges of optometry, as well as the Association of Schools and Colleges of Optometry (ASCO), began to lay the foundation for modern curricular reform in optometric education. In 1987, ASCO adopted and published a "Strategic Plan for Optometric Education - Year 2000" that specifically addressed faculty development, curricular enrichment and teaching methodologies.[2] Taking note of the academic challenges that other major health professions face, optometric educators have had to deal with similar issues in committing to a program of educational reform.[3,4]

While the desired outcome of curricular reform is to provide better care to patients, the target appears to be ever moving as the dynamics, both internal and external to the profession, continue to unfold. Education and the delivery of health services are interdependent, and the nation's current emphasis on health care reform raises further questions as to the appropriate educational process to prepare optometrists for their participation in this new health care environment.

To complement its Strategic Plan, ASCO established a Committee on Academic Affairs (CAA) in 1989, with the responsibility of addressing those elements of the Strategic Plan relating to curriculum and faculty development. As a starting point, the Committee studied the curriculum at the various schools and colleges and the ASCO Curriculum Model published a decade earlier.[5] As expected, recent curricular expansion had occurred in the biological sciences where emphasis had been added in areas of endocrinology, biochemistry, general microbiology, clinical medicine and immunology. However, these changes were not consistent across the various curricula, implying that the basic science education, and possibly the primary care training of optometry students, were uneven at the nation's schools and colleges of optometry. Many schools also reported that recent added emphasis in the biological sciences had been at the expense of content in the optical and visual sciences, two traditional strengths of optometric education and research.

The Committee, therefore, sought to establish a framework for a curriculum model that would reflect the changes occurring within the profession of optometry. Rather than relying on previous paradigms, the Committee sought to design a model that reached beyond the traditional listing of a content outline. A more dynamic information database would be needed for the new model to be of value to educational planners.

At the time the curriculum model was evolving, the profession's leadership had committed to a unified strategic plan to address the challenges facing optometric education and announced a "Summit on Optometric Education" series of conferences. The first, held in 1992, was jointly sponsored by the American Optometric Association and ASCO. The inaugural conference, held at Georgetown University, posed two questions to the participants:[6]

1. What are the educational expectations and advances necessary to meet the entry-level needs of the profession?
2. What finances and other resources are available to meet the educational needs of the profession?

A result of the Georgetown Summit and the subsequent Scope of Practice Conference held in St. Louis in July 1992 was to clarify that the scope of the profession (and, therefore, education) should expand rather than shift curricular emphasis. In addition, the commitment to maintaining a four-year professional curriculum was announced, together with the first profession-wide attempt to define those entry level clinical skills and abilities critical for establishing a curricular framework.

The Curriculum Conference, held in Denver, Colorado, July 30 - August 1, 1992, was the third designated confer-

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ence in the Summit on Optometric Education series. Whereas previous optometry curriculum conferences had focused on educational priorities and topical outlines, the 1992 conference established the following goals:

- To design an optometry curriculum model to meet the needs of entry-level practitioners within a four-year professional program.
- To explore options for more effective delivery of the curriculum through innovative teaching and learning strategies.
- To examine the need for and availability of resources to support optometric education in the future, including faculty, facilities and equipment.

This national curriculum conference attempted to address several converging forces and organizational mandates that included:

- Legislative changes in Scope of Optometric Practice:
  - The expanding scope of practice required the development of new segments of curriculum in both the basic and clinical sciences.
  - Increased professional responsibility for treatment and management of ocular disease.
  - The need for an educational infrastructure to support the biological and medical component of the curriculum.
  - The need to strengthen the biological bases of the curriculum in preparation for the expanding role of the molecular sciences on clinical practice.

- Health care reform:
  - A need to develop a curricular base appropriate to optometry's central role in primary health care delivery.
  - An evolving distinction between scope of practice and entry-level competency.

- Educational reform:
  - Increasing need for life-long learning skills to keep pace with informational and technological changes.
  - An information base which could no longer be contained in a four-year professional curriculum.
  - Increasing emphasis in health care education on concepts, rather than facts.
  - An increasing emphasis on the acquisition of critical thinking and problem solving skills.
  - A need to develop more efficient instructional methods and enhance independent learning behaviors.

The capstone achievement of the curriculum model was a decision by the Planning Committee to adopt an "outcomes based education" (OBE) approach.[7,8]

Advocates of the OBE philosophy begin by identifying an outcome as the successful demonstration of learning that occurs at the culmination of a set of learning experiences. Using OBE, curriculum planners use a "top down" design with desired curricular outcomes serving as the basis for determining curriculum content and educational strategies (learning experiences).[7]

For optometry, curricular outcomes are determined by ocular and related health conditions encountered in professional practice and the level of management expected of an entry-level practitioner. For purposes of constructing the curriculum model, these were labeled "priority" conditions and lists were developed, under the direction of the task force leaders, for each of six curricular tracks. The number of priority conditions was then modified on the basis of prevalence, morbidity and educational value. In addition, entry level competence for each condition was defined using management level descriptors. The management levels were used to indicate the ability of entry-level practitioners to mange each of the priority conditions.

Track members at the curriculum conference were assigned the task of first reviewing the "priority conditions" for inclusion and management level, followed by the writing of learning objectives for each condition across all disciplines. Thus, the curriculum model was designed using practice outcomes for entry level, and the clinical and basic sciences content was then expressed within a framework of six curricular tracks and academic disciplines (e.g., physiology, immunology, etc.).

Through the use of OBE, an emphasis upon learning objectives, skills and attitudes could be included within the curriculum model. Other key educational concepts that were incorporated in planning the model include: understanding concepts rather than facts; problem-solving; critically assessing scientific documentation; and a commitment to life-long learning. Since assessment is a derivative of learning objectives, this approach also has a fundamental impact upon examination formats for assessing these skills in students.

Each task force group developed a list of clinical conditions whose proper clinical management depended upon knowledge and skills contained within their curricular area. The list was to include initially all conditions that might possibly be managed by an entry-level practitioner. This list of conditions was narrowed using three criteria for "priority conditions": 1) prevalence, 2) educational value and 3) major principle/concept.

Prevalence

One of the requirements for inclusion as a priority condition was that the condition be frequently encountered. Thus conditions were assigned H (high) or L (low) prevalence using as a guide for high prevalence >1% of the general population.

Educational Value

Educational value of H (high) or L (low) was assigned for each condition according to what value the condition presents as a learning opportunity in either the basic/behavioral/social sciences or public health/general population issues. In this context, "basic science" refers to the condition illustrating specific disciplinary concepts; "behavioral science" refers to the condition illustrating either patient or provider behaviors; "social science" refers to the condition illustrating specific population factors.

Major Principle or Concept

In a parallel assessment of the conditions and not sequential to the above, major teaching concepts/principles best illustrated by each condition were identified using short descriptive key words.

The list was then reviewed by the task force leaders. Conditions which were considered of low prevalence, low educational value and whose principle concept was exemplified by another condition were eliminated. Conditions based on concepts previously addressed were also excluded, e.g., only one representative example of bacterial infection would be selected. In this fashion a true core curriculum was derived which covered all essential concepts. This is in essence a "minimum" curriculum. At the same time it is recognized that entry-level practice may necessitate knowledge of multiple expressions of any one or group of concepts, i.e., the practitioner is expected to manage all forms of bacterial infections. To facilitate these skills, an appropriate selection of conditions and exposure of students to patients with those conditions would

be ideal to support the minimum curriculum. One of the advantages of a minimum/core curriculum of this nature is that it ensures learning of all indispensable concepts vital to the practice of optometry and places responsibility for their application on clinicians. This is a responsibility which is initiated in training and carries on throughout their professional careers.

Management Levels

Four descriptors were developed to reflect levels of management at which one might expect the entry-level practitioner to perform. Each level included the depth of knowledge the student should possess and the ability to diagnose, treat and manage each of the conditions. In effect, these begin to define entry-level competency on a condition by condition basis. The management levels provide the first level of detail in delineating entry-level competencies and provide a framework within which the curriculum is derived. Details for each level are as follows:

Level #1

Should have detailed knowledge and direct clinical experience in diagnosis and independent management of this condition, i.e., every graduate of every college must be able to independently handle this condition with confidence (e.g., myopia, blepharitis).

- If a given condition has a propensity to move from a stage where optometric management is sufficient, to a stage where surgical intervention is indicated, and the optometrist should be able to fully manage the condition up to the point of surgery, level #1 should be assigned (e.g., keratoconus, primary open angle glaucoma).

- If a given ocular condition is a manifestation of systemic disease and the optometrist should be able to fully manage the ocular component completely on his/her own up to the point of ocular surgery, if indicated, level #1 should also be assigned.

- This level, with the modifier, emergency care, should also be assigned to any systemic condition in which the optometrist would be expected to render emergency care within scope of license until responsibility for the patient can be transferred (e.g., anaphylaxis, myocardial infarction).

Level #2

Should have detailed knowledge and direct clinical experience in diagnosis and co-management of the condition, i.e., every graduate of every college must be able to confidently handle this condition in a co-management approach, (e.g., cataract, corneal grafts, strabismus).

Level #3

Should have detailed knowledge and clinical experience in differential diagnosis and staging, and be familiar with available treatment modalities, but need not have managed such a case beyond obtaining sufficient clinical data to determine whether to either continue observation or refer (e.g., anomalous correspondence, intraocular tumors, diabetic retinopathy, non-asthenopic headache).

Level #4

Should have knowledge of the condition sufficient to appropriately triage and refer, but would not be expected to reach a definitive diagnosis or have more than passing familiarity with management (e.g., orbital masses).

For each condition or group of conditions, the student would be expected to know the information in some or all of subcategories a-k below, depending upon designated expertise level.

a) Epidemiology/demographics (including public health and environmental factors)
b) History
c) Symptoms
d) Physical findings, signs, and mechanics of, basis for, and interpretation of tests and procedures performed by optometrists
e) Laboratory findings, and mechanics of, basis for, and interpretation of tests and procedures by optometrists (e.g., diagnostic microbiology, cytology, blood-sugar)
f) Other physical findings (signs). Indications for tests and procedures requested by optometrists in consultation with others and the interpretation of reports on such studies (e.g., angiography, imaging studies)
g) Other laboratory findings, including indications for test and procedures requested by optometrists in consultation with others and interpretation of reports on such studies
h) Differential diagnosis
i) Referral criteria (where applicable)
j) Treatment and management/co-management
k) Prognosis (including genetic counseling, if indicated)

For Expertise Level #1 - students should know the information outlined in categories a-k for each diagnosis assigned this level, with the exception of surgical management procedures.

For Expertise Level #2 - students should know the information outlined in categories a-k for each diagnosis assigned with the exception of surgical management procedures.

For Expertise Level #3 - students should know the information outlined in categories a-i and category k for each diagnosis.

For Expertise Level #4 - students should know the information outlined in categories a-e, i and k for each diagnosis.

Learning Objectives

The "Priority Conditions," "The Principles/Concepts," and the "Levels of Management" form the basis for the development of the learning objectives. The learning objectives define what the student should be able to do at the end of the four years of education.

Learning objectives for students having access to resource materials include the following elements:

Activity - being able to write a management plan (e.g., provide oculomotor treatment for amblyopia).

Content - being able to develop a program of in-office and home therapy exercises and goals to treat amblyopia.

Condition - being able to implement a therapy program to provide oculomotor training for amblyopia.

Learning Objectives should meet the following criteria:

Relevance - relevant and compatible with the concepts.

Clarity - no ambiguity in the wording of the learning objectives; words such as appreciate, understand, know (open to many interpretations) should be avoided; words such as compare, construct, contrast, differentiate, identify, list, recite, solve, write (open to fewer interpretations) are recommended;

Feasibility - describe what the student can achieve with the time and resources available;

Measurability - describe what can be evaluated. When possible, the objectives should include an indication of the minimum level of achievement for a satisfactory performance.

Following the Curriculum Conference, the ASCO Committee on Academic Affairs worked with the task forces to extensively review all the materials and to produce a curriculum model for the specific academic categories (i.e., the six curricular tracks). The goal of providing this data base (on disc) for each of the schools and colleges of optometry was accomplished in June 1994. The database contains individually tailored applications that can be developed by each individual optometry school or it can be referenced from the ASCO curriculum model.

The database was established using all priority conditions. For each condition, identified in one field of the database, there are four other fields associated with it for a total of five fields. These represent (a) the task force category under which the conditions were identified (e.g., glaucoma can be found in the category "ocular"; (b) the concept(s) to be taught that is (are) linked specifically to conditions; (c) the traditional discipline under which the concept is traditionally classified (e.g., anatomy vs geometric optics) and (d) the specific learning objective(s) that must be met by the student in order to demonstrate competency.

The database allows a user to search for and acquire detailed information. For example, it is possible to determine that in the case of amblyopia, there are four relevant principles or concepts, each with one or more learning objectives. These are, according to the wisdom of the task force, the essential elements to minimally prepare the entry-level practitioner to properly manage such a case in practice.

Given that the project was conceived to reduce needless repetition of concepts and to emphasize student competencies as identified by the learning objectives, the total number of conceptual elements on this type of curriculum is smaller than that found in an encyclopedic content outline. With the database format and with an appropriate search mode, a user can quickly identify the total number of priority conditions that an entry-level practitioner should be able to manage. Alternatively, the user could search for the number of concepts associated with cataract or congenital nystagmus, or identify which priority condition(s) might be used in a lecture to exemplify obstruction to vascular flow, thus relating that concept to a condition the student is apt to encounter in practice.

From an institutional viewpoint, further programming, data collecting and assessment would be desirable and would allow faculty to compare their own curriculum to the ASCO "model." The database, as constructed, allows each institution to add new fields to those in the ASCO document, permitting it to identify in which course the priority condition is taught (e.g., anterior segment disease), the chronological point when the concepts are taught (3rd year, spring semester), and by which instructor. Each institution will also be able to place its own curriculum in the ASCO format to facilitate comparisons.

Thus, with this database, the interconnections between disciplines, concepts, and conditions can be probed by running the appropriate search. Redundancies can be discovered, omissions identified and sequencing of material adjusted. The clinical instructor can then identify whether a student has been exposed to a condition and can help the student recall the condition when the concept was initially presented. The student can then extrapolate from one priority condition to another and assume more of an active, critical thinking role in the process of clinical reasoning.

In summary, the development of the ASCO database will provide each user with:

- a different philosophical approach to the curriculum
- a skeleton of all essential curricular components as identified by national task forces
- a database that is available for computer manipulation rather than hard copy documents
- the possibility for a user to "customize" the database
- support for specific applications such as "school to ASCO" comparisons

In conclusion, it must be emphasized that the ASCO Curriculum Model offers a philosophical approach to curriculum design. This "outcomes based" educational design is dictated by what optometrists actually do in practice, rather than using the basic biological and visual sciences as a framework for clinical applications. As the model was developed, attention was paid to the integration of curricular elements with the final product providing a map for instructors who teach the various disciplines. Using this philosophical approach, the curriculum is driven by priority clinical conditions rather than by the traditional subdivisions such as visual optics, microbiology, pediatrics, presbyopia, gerontology, sports vision, practice management, ethics, contact lenses, etc.

Due to the complexity of the task, the ever changing information base and technological advances, the curriculum model will be considered a "living" document with modifications occurring on a regular basis. The curriculum model produced in 1994 should not be considered complete. The task forces assigned to each track will be given the responsibility of continuously modifying and upgrading the material to reflect current philosophy and content. This model is designed to serve as a reference for optometric educators and is not intended as the definitive curriculum for the profession. In many ways, it is designed to provide a global road map rather than serve as an index for teaching a particular curricular element.

Good theory is invaluable, but it must lead to practical outcomes which benefit patients. The curriculum model was developed with this purpose in mind, together with a commitment to make those changes in the educational process needed by the profession as we enter the next century. ■

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Effective Teaching Strategies

David A. Heath, O.D., Ed.M.

Introduction

Over the past decade, the heavy reliance of health professions education upon lecturing as the primary method of instruction has been called increasingly into question. Broad educational goals that extend well beyond the learning of factual information and into the development of critical thinking skills (among others) are now competing with a rapidly expanding knowledge base for teaching time in the curriculum. Health professions educators are asked to accept responsibility for facilitating critical thinking abilities, the development of self-directed learning behaviors and promoting a sense of social responsibility.

The instructional methods by which information and skills are taught and the roles of the teacher and the student relative to learning must be explored. Determining the appropriate balance between teaching content and higher level analytical skills and identifying the teaching strategies best suited for achieving that balance is a continuing challenge.

Teaching Strategies

As effective teaching strategies are explored and identified, the discussion must be tempered by the constraint of time. Given an already crowded curriculum, the instructional method used must be not only effective, but also must make efficient use of time.

A discussion of teaching strategies may be framed by four basic questions:

- What knowledge should the graduating student have learned?
- What skills should the graduating student have mastered?
- What teaching methods are effective for achieving the first two?
- Are the desired knowledge, skills and attitudes reflected in the methods of assessment and in outcomes measures?

What knowledge should the graduating student have learned?

The learning objectives for a four-year optometry curriculum should reflect and embrace the minimum knowledge required for entry level competence as an optometrist. Inclusion of any topic should indicate that it is **essential** and thus ***non-negotiable***.

Even with this concept as the defining characteristic for inclusion in the curriculum, the breadth of information needed by the entry level practitioner is staggering. Curriculum and instructional design must facilitate the learning of this knowledge, while cultivating additional skills such as critical thinking and self-directed inquiry. In many cases, these other skills may be of greater significance to patient care.

What skills must be the graduating student have mastered?

Technical skills and knowledge base are the preeminent features of past curriculum design efforts. These abilities are relatively easy to identify and are prone to objective measurement. Many other skills required of doctors of optometry are not. These skills include critical thinking, clinical problem solving, and communication skills along with other characteristics that help define the professional.

The graduating doctor of optometry needs to be "educated" for entry level competency, but must also be capable of sustained growth through "independent" learning. Sustained growth is a moral responsibility and an obligation of the optometrist to patients and the profession. The dimensions of "educated" and "independent" provide two broad categories into which skills or characteristics may be divided.

Educated	Independent
1. Technical Skills (Psychomotor)	1. Self-motivated
2. Knowledge (Content)	2. Inquisitive
3. Analysis (Integration)	3. Critical thinking
4. Communication Skills (Respect)	4. Self-critical
5. Values (Ethics)	5. Self-reliant

Characteristics of independence, expected of a health care professional and long acknowledged, but frequently under emphasized in the educational process, have become more critical in the face of rapid change. Practitioners must engage in life-long learning, possess the ability to critically assess

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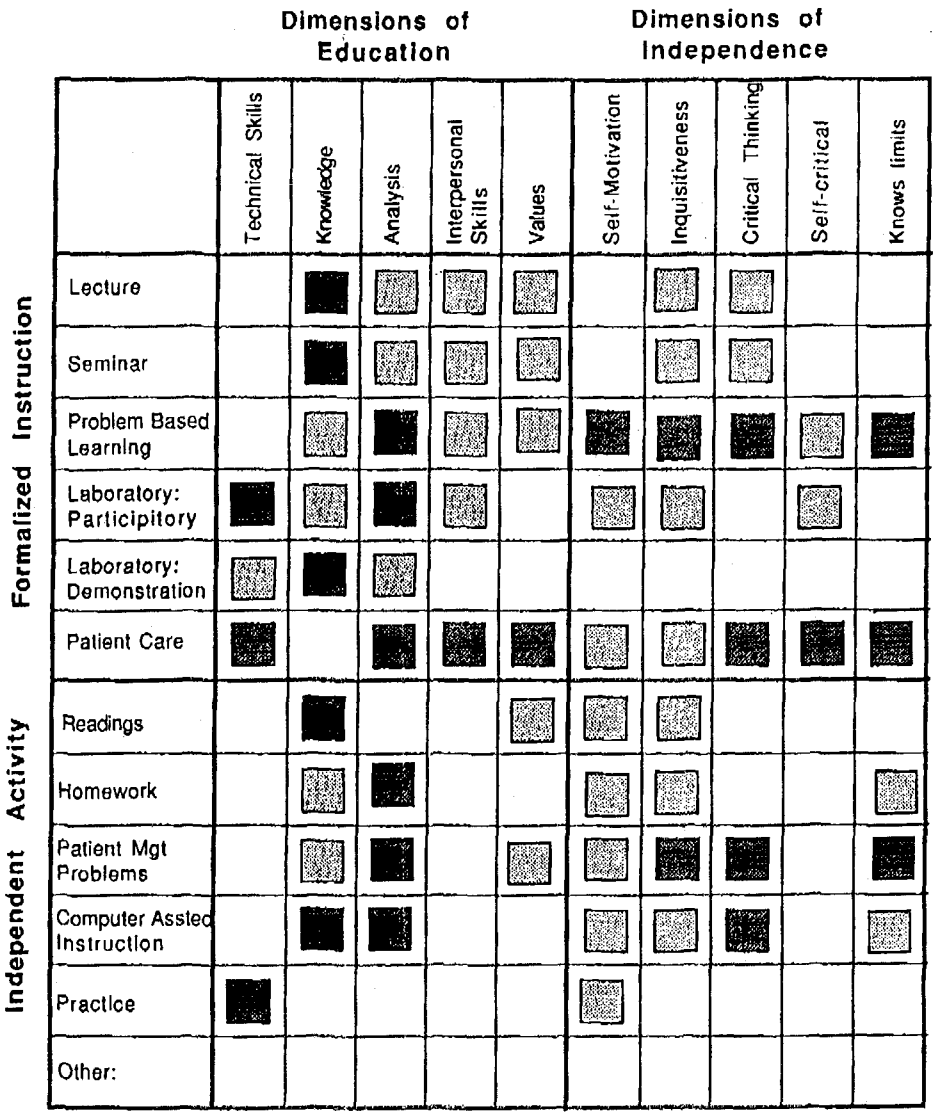
FIGURE 1
Teaching Strategies for Skills Enhancement



new information and be able to assimilate new techniques and technologies if their patients are to receive quality care over the course of time. Equally important is the graduate's ability to recognize and acknowledge their own limitations. Today's graduates must thrive as independent learners.

What teaching methods are effective for achieving the first two?

There are numerous teaching strategies to be considered. Through dialogue, it will become obvious that there are numerous variations within what may be perceived as a commonly understood approach, such as "lecture" and even more debate as to which skills can be taught through a given instructional method.

Several teaching methods are listed below and divided into general categories: 1) formal instruction and 2) independent activities. Additions to that list are encouraged.

Formal Instruction	Independent Activities
1. Lecture	1. Readings
2. Seminar	2. Homework Exercises
3. Problem-based learning	3. Patient Management Problem
4. Laboratories: Participatory	4. Computer Assisted Instruction
5. Laboratories: Demonstration	5. Practice
6. Patient Care	

It is also important to realize that the inclusion of a topic within the curriculum model does not require that the information be learned through formal instruction. Learning and the acquisition of knowledge do not always require the presence of a teacher. Arguably, the presence of a teacher may be more essential in cultivating higher level skills than in the transfer of information.

As alternate teaching strategies are debated, their ability to foster an array of skills needs to be examined. Efforts should be made to insure that each of the skills or characteristics noted previously is addressed within each curricular area.

Figure 1 was designed to view the relationship between skill acquisition and instructional method. The heavily shaded boxes indicate competencies highly affected by the teaching method, lightly shaded boxes suggest a moderate effect and no shading a minimal effect. The grid, as completed, has no basis in research, but rather is the outcome of discussions with a few faculty and is intended as a reference and stimulus for debate among the working groups.

Are the desired knowledge, skills and attitudes reflected in the methods of assessment and in outcomes measures?

An integral part of any teaching strategy is assessment. Outcomes assessment is a powerful tool both for insuring competency and for guiding student learning behaviors. Most students openly acknowledge that they modify their study behaviors and learning styles to meet course expectations. If a knowledge of facts is tested, a mastery of factual information occurs. If clinical problem solving is being assessed, problem solving skills will be acquired.

If a teaching strategy is identified as appropriate because of its effect upon critical thinking skills, the evaluation tool should be similarly suited and consciously included in the determination of teaching strategy.

Summary

Teaching strategies are not synonymous with instructional methods. Rather, they represent the strategic selection and implementation of instructional methods to enhance a student's skills or competencies to a predetermined level. ■

Curricular Implications of Current Scientific and Sociopolitical Trends

Melvin D. Shipp, O.D., M.P.H.

Recently, the optometry profession has experienced several significant changes: an expanding scope of practice, advances in diagnostic and treatment methods and alterations in health care reimbursement. To ensure the continued viability of the optometry profession to the year 2000 and beyond, it is imperative that schools and colleges of optometry have in common a core curriculum that is responsive to the present and future needs of new graduates and their prospective patients. In the pursuit of this goal, several key questions must be addressed:

- Do optometric curricula prepare entry level practitioners to provide contemporary eye and vision care services?
- Are optometric curricula designed to address the nation's future eye and vision care needs?
- Are graduates of schools and colleges prepared to assess and incorporate new scientific knowledge, acquire new clinical skills and continue their professional growth and practice viability throughout their careers?

We must ensure that **all schools and colleges of optometry produce graduates with clinical skills and expertise compatible with, and complementary to, the nation's contemporary and evolving eye and vision care needs.** To achieve this goal, optometry schools and colleges must effectively integrate specific academic areas — anatomy, physiology, optics, health policy, etc. — within a four-year professional curriculum. This curriculum model must be responsive to evolving scientific and societal trends and consistent with the long-term goals of the profession.

Scientific Trends

Advances in health care technology have affected all health disciplines. Current diagnostic methods are more sensitive, specific and less invasive than ever before, and patients receive safer and more effective treatment. Services and procedures, previously requiring hospitalization, are provided on an outpatient basis. Also, thanks to advances in public health and health science, once highly prevalent diseases and chronic conditions have been virtually eradicated — dental carries, polio, smallpox, etc. Due to ongoing scientific and clinical research, refractive errors, cataracts and glaucoma may soon share the same fate.

Advancing technologies have improved diagnostic, treatment and rehabilitative methods in eye and vision care. Automated refractors, automated visual field devices, non-contact tonometers and ultrasound are but a few of the important diagnostic developments. Both ophthalmic and non-ophthalmic products are employed in vision rehabilitation. Expanded applications of lasers for use in diagnostic and therapeutic purposes are currently under investigation. Improvements in contact lenses, ophthalmic lenses and therapeutic drugs have significantly enhanced and expanded the range of treatment options. It is likely that such scientific advances will accelerate in the future.

The National Institutes of Health (NIH) continues as the major contributor to health research. Its National Eye Institute (NEI) is by far the leading source of eye and vision research in the nation. Manufacturers of health related products have also invested significantly in research and development. To ensure the provision of optimal health services, optometrists must be prepared to assess and incorporate new technology, scientific knowledge and skills. Importantly, optometry must expand its participation in directing, planning and conducting health research.

Sociopolitical Trends

Purportedly, the United States has the best health care that money can buy. Unfortunately, in addition to being the best health care in the world, it is also the most expensive. More than 14% of our nation's gross national product is spent on health care — more than any other country in the world.

Antithetically, in spite of our significant financial investment in health care, infant and child mortality rates and life expectancy in the United States rank near the bottom of industrialized countries. There are a variety of reasons

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why this is true. Presently, over 35 million Americans do not have health insurance, and roughly 15 million more are underinsured. The inability to pay for preventive and outpatient care delays entry into the health care system, ultimately leading to more costly tertiary care and increasing risks of morbidity and mortality. There is growing bipartisan agreement — on the national and state level — that this situation is no longer acceptable; that something must be done. Presently, the questions of **what**, **when** and **how** remain unanswered.

Financing the burgeoning health care needs of older Americans is a continuing economic challenge. This problem is exacerbated by increasing life expectancies and new technology. Yet another major source of health care costs is associated with administrative waste, fraud and abuse. The recently created Agency for Health Care Policy Research is aggressively pursuing outcomes research. This research is designed to ferret out ineffective health services and procedures, or those with questionable or marginal benefits. Conversely, effective interventions will be identified and promoted. Health services research will be especially useful to the Health Care Financing Agency, and other organizations involved in the reimbursement of health related services.

America is in the midst of a health care crisis. Health care reform is inevitable. Presently, managed care is viewed as fundamental in controlling health care expenditures. Also, prevention, screening and early intervention strategies are perceived more favorably than procedures which simply "postpone death." As primary care health professionals, optometrists must be perceived as part of the solution to this crisis. Optometrists must effectively represent their profession, both within and beyond the examination room.

Solidarity of Purpose

The primary goal of the 1992 Curriculum Conference in Denver, Colorado, was to initiate a process to develop a curriculum model strategically compatible with current scientific, social and economic trends. An important subsidiary goal was that the model be adaptable to unanticipated future challenges and opportunities.

During the Conference, Task Force Groups were asked to enumerate specific priority conditions or areas within the current and projected scope of optometric practice, and the requisite basic science and clinical discipline(s) (i.e., vision science, epidemiology, pharmacology, etc.). This was an important first step in developing an optometric curriculum compatible with current scientific and societal trends. During the intervening months, those Task Force recommendations have been refined by educators, students, scientists, clinicians, academic administrators, licensing officials, optometric leaders and others.

The final product of the 1992 Curriculum Conference — a four-year curriculum model — is described in Dr. Berman's article. It will describe the essential core curricular elements for training entry level practitioners. This consensus based curriculum model will assist schools and colleges of optometry in providing clinical knowledge and skills commensurate with and complementary to, the nation's contemporary and evolving eye and vision care needs. ■

Are Qualified Faculty an Endangered or an Evolving Species?

Pierrette Dayhaw-Barker, Ph.D.

For any profession, the securing, development, retention and promotion of faculty empowered to teach and conduct research are obligations entrusted to colleges and universities.[1] This statement, paraphrasing words spoken by Dr. Bernadette Healy, former director of the National Institutes of Health, regarding research in the United States, focuses the responsibility to secure and nurture talented enlightened faculty directly onto the shoulders of the schools and colleges of optometry and their leaders.

Two words in particular bear emphasis. The first is that of "trust"; the second, "obligation." Professions have for decades placed their trust in the ability of academic institutions to secure well-credentialed faculty who are at the forefront of their respective disciplines. This implies a trust that the institution will anticipate change in the practice of the profession and thereby recognize the faculty credentials necessary to teach an evolving curriculum.

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Until the last decade, there had been a sufficient time lag between the discovery of scientific data and/or new technology and its application to allow institutions to predict the aggregate credentials necessary for the proper formulation and implementation of the curriculum. However, in the past decade, the time lag between discovery and implementation has shortened considerably, making it difficult for even the financially healthy institutions to adjust.

In optometry, the process is further challenged by (a) a profession that is based on several disciplines, each progressing somewhat independently of the other and (b) the reality that the evolution of the curriculum has been initiated as much by a political, legislative process as by developments in science and technology.

As complex as these difficulties might appear at times, they do not, however, release the institutions from the trust and obligation to provide for an appropriately qualified and enthusiastic faculty. Indeed, one is reminded of Lawrence Veysey's reflection in 1981 that "The most crucial ingredient in the excellence of higher education may well not be whether a precise number of courses are required, but the quality of the faculty teaching all available courses . . ."[2]

As we ponder and debate the many philosophical and pedagogical issues raised at the 1992 Denver Curriculum Conference, we should remember that no matter how visionary the approach is that we eventually adopt, we will need energetic, enthusiastic and skilled faculty and much cooperation from all optometric bodies in order to make it a reality.

Where, then, do we stand, and what do we need to do the job? To analyze our current status, one might use the 1990-1991 ASCO Annual Survey which reported the percentage distribution of 9- and 12-month faculty in rank without attention to discipline or quality.[3] These numbers show us that for the more senior faculty ranks, i.e., associate and full professors combined (47.8% in the 9-month category and 48.7% in the 12-month category) there are simply not enough of the instructors and assistant professors (42.7% in the 9-month category and 47.4% in the 12-month category) to replace the current faculty positions, and vacancies are unfilled every year.

These numbers are sobering. If one adds the expansion of optometry into disciplines that have not been within its traditional domain and the incorporation of teaching strategies that may require additional training, it becomes obvious that very serious planning indeed is necessary to ensure that there will be adequate numbers of qualified optometric faculty in the 21st century.

And we are not alone. Consider the fact that there were 4.1% vacancies within basic medical education in 1992, a number significantly up from a decade ago. The faculty growth rate in medicine has declined from a peak of close to 14% in 1970 to less than 2% in 1988.[4] Thus medicine does not have enough faculty to replace itself in certain disciplines. It also has a more senior faculty. As these individuals retire, and more than half the Ph.D.s being currently trained go into industry or research, few individuals remain who are dedicated to teaching.

In optometry, clinical training and education have gained such prominence that a large number of entering faculty are clinical educators. But what of the biomedical sciences, optics and physiological optics, public health and the myriad of technology-based and credentialed information sciences that will be part of our future training?

While the numbers are not available for optometry, it may be of strategic importance to identify the number of our residency-trained and graduate students who enter into the optometric teaching profession. We should further identify their credentials and analyze the match between credential and disciplinary need as well as review our graduate training strategy to ensure that it is adequate.

We also need to bring our attention to the kinds of teaching proficiencies that will be needed by the faculty. Clinical degrees and doctorates of philosophy do not provide training in teaching methodologies, nor do they provide assessment skills. Thus there should be a forum for reviewing and discussing the teaching and technical skills, evaluative skills, group skills and administration management skills that institutions will need to appropriately fulfill their mandate. Certainly if the decision is made to move towards problem-based learning where small group interactions or mentoring are more prominent, it would be self-defeating to do so without a clear understanding that the faculty role is different in this type of teaching than it is in the lecturing mode.

Strategies

Strategies for immediately addressing a few of these problems could include options for current faculty to update their skills (whether disciplinary or teaching) through increases in sabbatical leaves. In the past, sabbatical leaves stressing the development of research skills or those clearly directed at producing new grant initiatives may have been perceived as more closely aligned to the overall goals of the institutions. The time has come to encourage equally leaves that specifically develop or enhance teaching skills especially where exposure to new technologies (including computerization) could "jump start" a program. Support should also be given for those leaves that allow faculty members to update themselves in their special disciplines. This would involve not only the traditional department of physics or biomedical sciences but exposure in clinics, hospitals and industrial settings.

Another option is formalized inter-institutional sharing of faculty. Administrators may wish to consider supporting the joint institutional development of courses whereby faculty from two or more institutions spend their summer months together restructuring courses. This may be especially attractive in situations where content may require two or three in-house experts to develop and/or teach a course and where one institution has one kind of expert and the sister institution has the complimentary level of expertise. This method may bear specific application where one's expertise is in one or more methods of alternative teaching.

Another strategy involves the development of summer workshops specifically addressing teaching methodology and modeled after effective programs like the Gordon Conference or the Woods Hole summer programs. In the former, experts in one area join together for a short period of time exploring pre-selected topics. Each has an assignment and must actively participate or face the possibility of not being invited to future conferences. The Gordon Conference format also imposes restrictions on participants where one must emphatically respect authorship of ideas and programs, lest he/she be shunned in the future. It works even in this era of aggressive research competitiveness and could be equally effective in exploring teaching strategies and enhancing disciplinary knowledge. The Woods Hole summer program, on the other hand, facilitates the bringing together of colleagues who each independently work on their own areas of research but are housed and technologically supported in a pleasant atmosphere that encourages collegiality.

The above are short-term strategies to sustain current faculty, but longer term strategies would also be needed such as including training in teaching skills within graduate programs and residencies/fellowships. This could be done as an optional tract or as a series of electives for those individuals wishing to pursue teaching careers. Perhaps joint M.Ed./M.S. programs would be worth considering especially if these were directed at methods of solving discipline-specific teaching problems that faculty are apt to face in their careers. Such programs could include training in teaching technologically-assisted approaches and methods of teaching clinical problem solving.

Impact

If alternative teaching is mandated, the institutions must adapt to the difference in staffing pattern that such teaching imposes. The faculty/student ratios, the contractual obligation, the evaluative process, especially that leading to promotions and tenure, are different in these circumstances. Certainly two of the more controversial areas will be the responsibility of the faculty member to conduct research and whether educational research becomes as important as disciplinary research.

While these thoughts address philosophical and organizational change within the academic institution and challenge the foresight and administrative skills of our leaders, faculty must also bear some soul-searching of their own. Faced with the possibility that there may well not be the numbers of faculty in future years to adequately staff all areas, the decision to embrace alternative teaching methodologies may be either a godsend or a nightmare. The faculty members will be forced to look at their own ability to keep abreast of a field that might be galloping through scientific discoveries. Concurrently, they might have to develop and provide information or tutelage for student learning via CD-ROM technology. This may involve undertaking a far greater mentoring role, and team teaching or computer-authoring skills might be significantly more important than those of solo lecturing.

There is no doubt that the way we deliver education is changing. At this time, we need to stress effective teaching methodology, currency in our disciplinary topics, technological proficiency in our skills and almost prophetic qualities to our planning and implementation. We need courageous leaders and dedicated faculty willing to reinvent the wheel if necessary in order to provide our future clinicians with the skills to make them superior clinicians in the twenty-first century. We need support and understanding from members of the profession that, in this role, we are meeting our obligation to society. ■

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Student Attitudes on the Purchase of Required Optometric Textbooks

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Abstract

Textbooks are an important part of optometric education but little is known on the proportion of students who buy textbooks and what factors influence their decisions. We investigated this by surveying first and third year optometry students at the New England College of Optometry and Ferris State University College of Optometry. Surveys were administered during final exam periods of courses matched for text and price of required text ($65). Results revealed that 96% of students overall purchased required text books. Differences in student compliance were noted between first and third year students at one college but not the other. Most students were satisfied with their initial decision of whether or not to purchase the required text. Almost half of students who did not purchase the texts would have if the price had been $50. Twenty percent of students thought requiring a text book was unreasonable. These and other results are discussed and may assist optometric educators in planning course readings.

Key Words: textbook, student compliance, required reading

Introduction

Textbooks and required readings are important components of many classes in the optometric curriculum. A textbook may complement the lecture material by providing alternative explanations on subjects covered by the instructor. It may be a source of new information which cannot be included in lectures due to time constraints. It may also serve as a source of homework to reinforce the material covered in lecture. A textbook is an organized and accessible reference for future use in practice or board preparation.

Given their importance, it is disappointing to many optometric faculty to see students decide against the purchase of textbooks. In one survey, students indicated frustration with textbooks including understanding and retaining information.[1] In this same survey, many students reported not reading their assignments because they discovered teachers rarely used test questions from required reading.[1] The main reason cited by students, in our experience, is that textbooks are too expensive. We have also observed these same students making other choices in their lifestyles that are expensive. Given this paradox, we decided to survey student attitudes on the purchase of textbooks. It was hoped that several issues could be addressed through this study. Is cost the main factor affecting whether or not students purchase books? Is there a range of prices that would lead to more students purchasing textbooks? Do student attitudes on purchasing textbooks differ between first year optometry students and third year optometry students? Do student attitudes vary among optometry colleges? Are student perceptions realistic?

In the following discussion, we provide some insight into student attitudes and behavior. We also attempt to advise the optometric faculty member on strategies that may encourage students to comply with purchasing required course textbooks.

Methods

Students in the first and third year classes at the New England College of Optometry and Ferris State University College of Optometry were asked to participate in a survey about optometric textbooks. Sample size and course titles are presented in table 1. All surveys were completed during final examination periods of the winter 1992-93 academic quarters. This insured a similar time frame during the academic year for all respondents and near 100% attendance of classes. Courses were selected to match as closely as possible for topic, emphasis on required reading, and price of textbook. Price of textbook was given priority in matching when equality could not be obtained in other aspects. Each book was required by the instructor and required readings or homeworks were assigned for each book. The price of each book ranged from $65.00 to $70.00. Instructors for each class were different. The colleges chosen were deliberately unmatched in terms of cost of attendance (tuition, cost of living). This was done to see if student compliance in buying textbooks and student perceptions of finances were different within two different examples of financial burden.

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A copy of the survey is provided in appendix A.

Results

The survey return rates were as follows: NEWENCO OD III; 80 out of a possible 93, NEWENCO OD I; 75 out of 96, FSU OD III; 28 out of 31, and FSU OD I; 31 out of 32. This represents, on average, a rate of return of 85%. Responses to selected questions are presented graphically in figures 1-6. Figure 1 shows the breakdown by class of the percent of students who purchased the required textbook. Little difference in rate of purchase exists between the NEWENCO OD III and OD I classes (55% and 52% respectively), but a significantly high number of FSU OD I students purchased the text (84%) compared to FSU OD III students (39%). The difference of FSU OD I students was significantly different (Chi square Likelihood Ratio 14.63, p=0.002).

TABLE 1
Courses in which survey was administered

NEWENCO OD III	Pediatric Optometry
NEWENCO OD I	Ophthalmic Optics
FSU OD III	Pediatric Optometry
FSU OD I	Neuroanatomy

Responses of students who purchased required textbook

The following results relate only to those students who purchased the required textbook for their course and represent responses to questions a through d. Responses for question a on the survey are provided in figure 2. It can be seen that many more NEWENCO OD III students found the text to be directly useful in doing well in the course than other groups. The NEWENCO OD III group differed significantly (Chi Square Likelihood Ratio 49.8, p>0.0001). Questions b-d responses were similar among all groups and are not presented graphically. Almost all students who bought the required text were glad they bought it, planned to keep it, and thought it would be useful in the future.

Responses of students who did not purchase the required textbook

The following results relate only to those students who did not purchase the required textbook and represent responses to questions e through m on

FIGURE 1
Percent of students who purchased required textbook

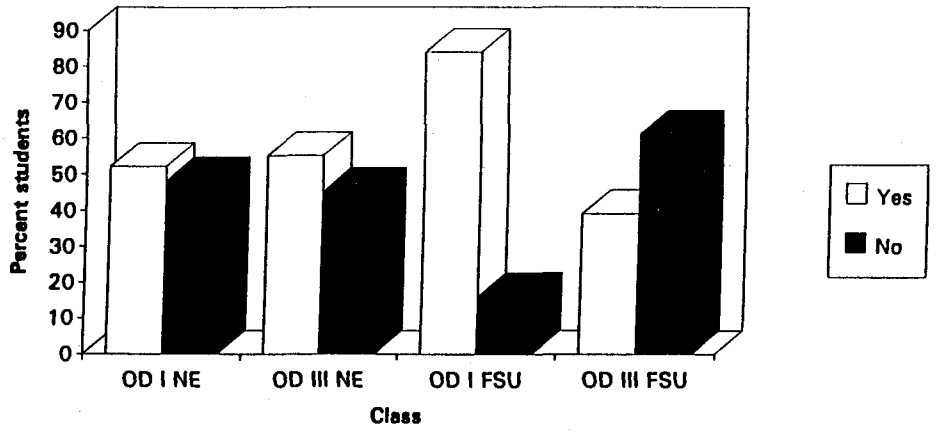


FIGURE 2
Was the text directly useful in the course?

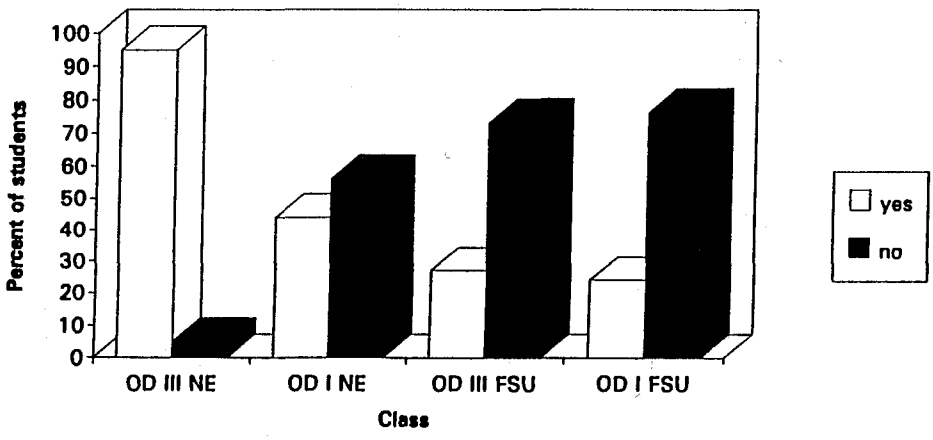


FIGURE 3
If you could do it over, would you buy the required text?

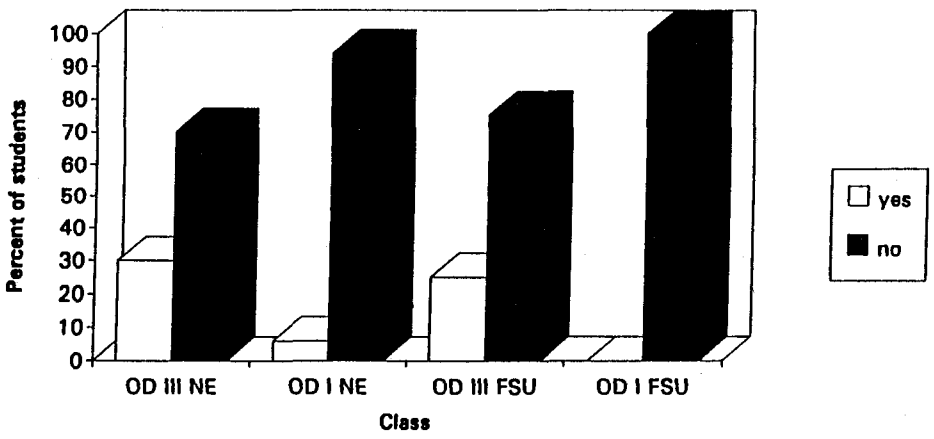


FIGURE 4
Price students would pay for the required text

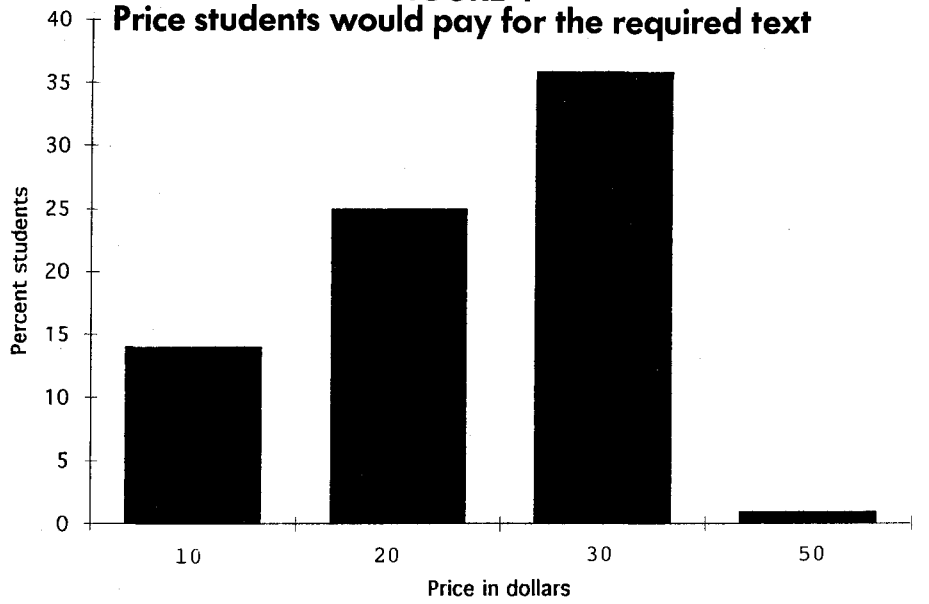


FIGURE 5
Would you be more likely to buy text books if tuition were lower?

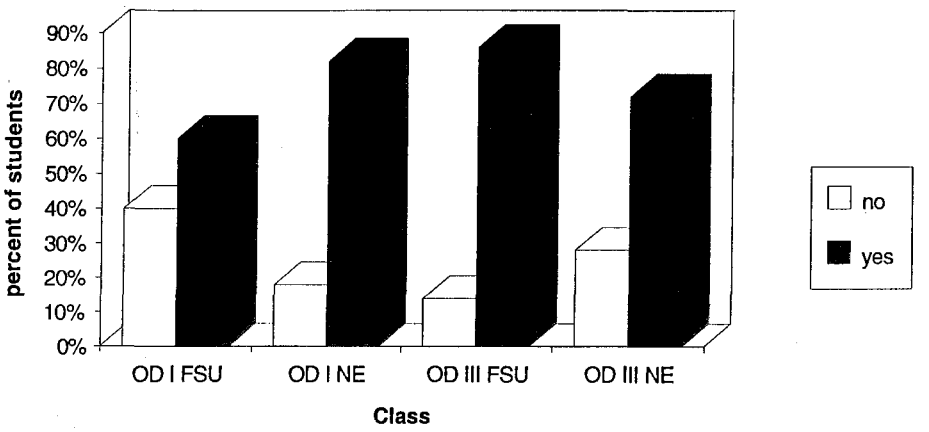
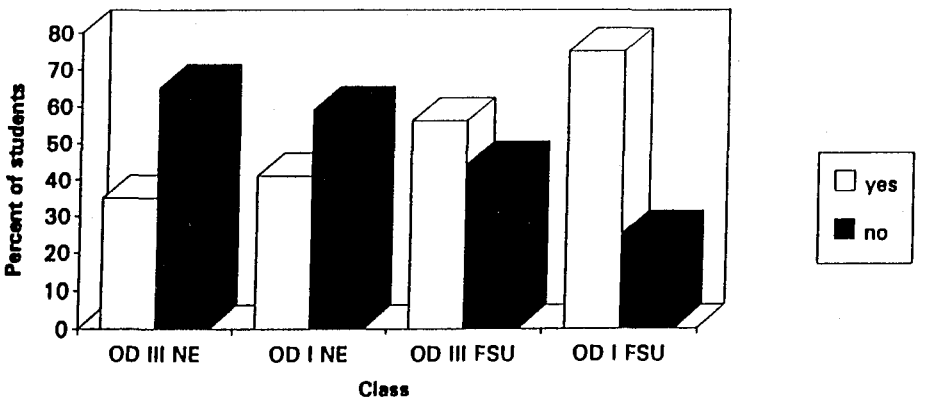


FIGURE 6
Do you generally not buy texts because instructors do not test from reading material?



the survey. Responses of question e are presented in figure 3. Slight differences exist between classes, but the overall trend is similar for each: most students who did not buy the required textbook would not do so if they were to take the course again. Figure 4 reveals the maximum price various students would have been willing to pay for the required text specific to their class. No differences between classes or colleges was found, so the data were combined in figure 4. This figure clearly shows a break point at the $30 level with additional student likelihood of purchase at $20 and $10 levels. From this, it is likely that if the price of the required texts were $30, 48% of those students who did not purchase the text would have. At $20, 73% would have purchased. Combining this data with those students who purchased textbooks, a price of $30 would mean 77% of respondents purchasing required textbooks. At $20, a total of 88% of students would purchase. On another note, 12% of respondents indicated they would not even pay $10 for the required text!

Questions j and k are not reported graphically. There were significant differences between colleges on the question of photocopying. No FSU student reported photocopying material from a borrowed text book while 48% of NEWENCO OD III and 57% of NEWENCO OD I students reported photocopying. This difference between schools was significant (Chi Square Likelihood Ratio 32.41, $p>0.0001$). Twenty percent of respondents thought that having a required textbook was unreasonable. There was no difference between schools, but between FSU classes there was. Forty percent of FSU OD I students thought it was unreasonable while only 6% of FSU OD III students thought it was unreasonable.

Figure 5 shows responses to the question of whether the purchase of required textbooks would be more likely if tuition were lower. There was no statistical difference between groups (Chi Square Likelihood Ratio 6.23, $p=0.3975$). All groups indicated that books would more likely be purchased if tuition were lower. This opinion was overwhelmingly high in all groups except the FSU OD I class which was modestly high. Figure 6 reveals responses on whether students do not buy texts because they think instructors do not test from required reading. While the FSU students indicated that this was often true, NEWENCO students indicated it usually was not. However, there was no statistical

difference between colleges (Chi Square Likelihood Ratio 3.7, p=0.2900).

Discussion

Our survey reveals some interesting perceptions among the classes surveyed. Overall, there was no difference in rates of textbook purchase between OD I and OD III students. At FSU, however, a significant difference was noted where 83% of OD I students purchased the text while only 39% of OD III students purchased the text. It might be expected that OD I students would be more likely to buy required materials because they may be more naive of their abilities and more easily influenced by instructors. Further, OD III students might be less likely to buy because they know what it takes to pass a course and may also be feeling the money crunch more with an increased debt and fourth year rotations in the near future.

A possible explanation for NEWENCO and FSU class purchase rates is the difference in class sizes. Perhaps the large class size at NEWENCO makes an OD I student feel more a part of the crowd, so the chance of being called on in class or having to hand in homework is lessened. This is contrasted to the small class size at FSU where each student is known by name to the instructor. Thus, the FSU OD I student is more likely to comply with an instructor's requirements. Another possible explanation is simply that the FSU OD I class is an exceptional class in terms of compliance and that if the survey were to be repeated next year a different result would be found.

The results of the survey showed that students were generally satisfied with their initial choice of whether or not to purchase the text. Almost all students who purchased the text indicated they were glad they did. Almost all students who did not purchase the text would not do so if they had to do it again with hindsight. Furthermore, almost all students who purchased the text intended to keep it and thought it would be useful in the future. Whether this satisfaction on initial choice and expenditure is due to actual use or is merely a response based on cognitive dissonance, we cannot say. It could be that respondents simply wanted to feel that they made the right choice.

Little is available in the literature on how to select a textbook. In a literature search we located only two articles on the subject.[1,2] The emphasis of each article was on readability of texts and future usefulness. Price was mentioned briefly in one.[2] Thus, the most useful part of this report may be the issue of price and student compliance. On the average, 56% of all students purchased the required text at the $65-70 bookstore price. If the bookstore price had been $30, 77% of students would have purchased it. If the price had been $20, 88% of students would have purchased it. It is likely, therefore, that if a faculty member can find an adequate text on the subject for $30, a dramatic increase in student compliance in purchasing the text would occur. This assumes, however, a comparable text (hardcover, 400 pages). If the text were not comparable, the student purchase rate might be different.

The issue of borrowing a text and photocopying the required readings proved to be a college issue. Apparently, the FSU students surveyed have not utilized this possibility while the NEWENCO students surveyed use it commonly. At NEWENCO, students sometimes photocopy a text by reducing 2 pages to 1. Even in a course where 400 pages of reading are required, students can secure their own complete copies for a fraction of the bookstore price. Whether students recognize or consider that this violates copyright was not studied.

Twenty percent of students thought having a required textbook was unreasonable. Several of these students qualified their response by stating that requiring a $65-70 textbook was unrea-

APPENDIX A

Answer all questions yes or no. Do Not put your name of the survey.

Did you buy the required text?

If **YES**, answer questions **a-d** below. If **NO**, answer questions **e-m** below.

a. Was the text directly useful in doing well in this course? _____

b. Are you glad you bought the text? _____

c. Do you plan to keep the text? _____

d. Do you think it will be helpful to you in the future? _____

e. If you had to do it again, would you buy the text? _____

f. If the text had been $50, would you have bought it? _____

g. If the text had been $30, would you have bought it? _____

h. If the text had been $20, would you have bought it? _____

i. If the text had been $10, would you have bought it? _____

j. Did you borrow the text and photocopy all required reading assignments? _____

k. Do you think having a required text is unreasonable? _____

l. If tuition were lower, would you be more likely to purchase a required text? _____

m. Do you generally not buy texts because you believe most instructors test from class material and not from assigned reading? _____

Thank you for your time.

sonable, but requiring a more moderately priced textbook was not unreasonable. It is difficult to interpret this response because our survey did not separate required purchase from required work. However, we believe that the majority of these respondents believe they should not have to purchase textbooks for a course. This attitude is contrary to traditional expectations of college administration and faculty on the responsibility of the student.

Another insight into student perceptions is the response to "would you be more likely to buy textbooks if tuition were lower?" The unequal matching of NEWENCO and FSU was done purposely to test a hypothesis that if students did not have to spend as much on tuition, then they could more easily afford textbooks. For the 1992-93 year, tuition at NEWENCO was $16,800 compared to $6,231 at FSU. Further, annual cost of living estimates for NEWENCO students in Boston, Massachusetts, was $11,200 compared to $5,000 for FSU students in Big Rapids, Michigan. Thus, the expense of attending NEWENCO was 2.5 times higher than attending FSU. Despite this difference, about the same percentage of students at NEWENCO and FSU declared that they would be more likely to buy textbooks if tuition were lower. However, the percent of FSU students who bought required textbooks was not higher than NEWENCO students.

The final subject to be addressed is whether students generally do not buy textbooks because they believe instructors do not test from the reading material. In our experience, students often complain that they purchased a text, did all the reading required, but did not do better in the course grade than classmates who did not do any of the readings. This attitude was a minority in this survey. Most NEWENCO students indicated that this was not true. Most FSU students indicated it was true. The difference was not statistically significant. Therefore, it seems that some students have rejected purchasing textbooks based on previous experience with instructors who do not emphasize required reading. However, the majority of students reject purchase of required texts for other reasons.

It is hoped that the preceding survey and discussion has provided new insights into student compliance in purchasing required textbooks. From this project, it can be concluded that:

- 56% of students in this sample purchased textbooks as required by course instructors.
- Little difference exists between OD I and OD III students at NEWENCO in purchasing required textbooks, but significant differences exist between OD I and OD III students at FSU.
- Most students are satisfied with their original decision of whether or not to purchase a required text.
- A $30 textbook price would increase the percent of students purchasing the required text from 56% to 77%.
- Twenty percent of students sampled think having a required text is unreasonable.
- Students believe that if tuition were lower, they would be more likely to purchase textbooks, but this was not shown to occur in a comparison of high and low tuition schools.

Faculty may find this information useful when planning a course or reading assignments. With this knowledge, it is hoped that new ideas on generating student compliance can be obtained. ■

Acknowledgement:

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COMMENTARY

Moral Education and Professional Development: A Continuing Challenge

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Graham Strong, O.D., M.Sc.

Over the past twenty-five years, many professional groups and organizations have identified a need for training and development in moral reasoning and ethical decision making. It is only recently, however, that a similar concern has been demonstrated in optometry. While it might be of interest to speculate or even investigate the reasons as to why the optometric profession has been slow in jumping on the ethics bandwagon, such speculation and investigation may be of little practical consequence. In fact, optometry's more recent entrance into this domain may prove advantageous in the long run, since much can be learned from the experiences of other groups in their relative successes and failures in providing moral education and ethical instruction for their adherents. It behooves the optometric profession to draw upon past successes while avoiding the pitfalls of those who have preceded it as the profession attempts to define its own model of professional education and development in this regard.

Without delving deeply into the cultural and religious bases, it is safe to say that our society has experienced a significant decline in the general capacity for moral reasoning and ethical decision making. This decline has been accompanied by an increasing faith in science as the source of truth. But the scientific method, with its emphasis on careful empirical observation and its supposed "value free" pronouncements, is best suited for descriptive claims about the way the world is; it is less adept at making normative, evaluative judgments about the way things ought to be. The latter, of course, are exactly the kinds of evaluative questions addressed in ethics.

While optometrists are generally well trained in the careful methodology of scientific observation and interpretation, their skills at making discriminating judgments about non-empirical evaluative issues are often less refined. The challenge for optometric education is to find effective means for developing these skills. For moral education, like any educational endeavor, is not simply a matter of knowledge acquisition; much of what is needed is skill development. The skills in view here include those of recognizing value dilemmas in general and moral dilemmas in particular, of identifying the relevant kinds of claims and considerations which have to be attended to, and the skill of communicating, both sensitively and effectively, necessary information on such matters so that patients, fellow practitioners and other affected parties can make informed and effective decisions.

While it is impossible to separate completely the knowledge component from the skills component in moral education, it is important to recognize the distinction. Failure to do so can lead to a number of ineffective approaches to moral education in the professions. One kind of problem concerns those given the task of "moral instructor"; another has to do with the adoption of an educational model. These problems are closely related, but each deserves discussion in its own right.

Problems related to the personnel involved in ethics instruction come in a variety of forms. In some cases ethics is perceived as little more than a trendy topic and is included in the curricula for mainly cosmetic purposes. It looks good to have a course or module on ethics education, so some provision is made to include one. In these instances little attention is given to the choice of instructor; it does not really matter, just so long as someone does it. It is not uncommon in such cases to have a junior member of the faculty take on this additional "chore." The unlucky recruit peruses a couple of articles (maybe even a text on professional ethics), and offers a few disjointed insights to a less than enthusiastic audience.

One would hope that the foregoing is the exception rather than the rule in professional ethics education. In fact the majority of institutions take the teaching of ethics very seriously. But the problem of finding an appropriate instructor still remains. Two other approaches to doing so are common, each with its own attendant problems. The first might be called the "sage advice" model, the second the "moral expert" model.

In the "sage advice" model, a long time member of the faculty or profession is given the opportunity to share his or her practical insights based on years of experience in the field. While there is much to be gained from moral mentors as such, and senior members of the profession carry a special obligation to model appropriate ethical behavior for their junior colleagues, this model fails to acknowledge the changing nature of the social context in which moral decisions must be made, and the increasing complexity of the moral decision making process. Indeed it assumes that those with much experience have the appropriate knowledge and the proper set of values in the first place, and are thereby best suited to impart this wisdom to the moral neophytes of the profession.

The "moral expert" model suffers from an opposite kind of defect. In this model the increased complexity of the moral domain is recognized, and the limitations of those working in the field — whether newly arrived or long on experience — to address the issues is acknowledged. The response is to engage a professional ethicist to handle the task as a specialist in the field. The implicit assumption is that moral knowledge is highly specialized in nature and is best left to the experts. Just as it is common to defer to specialists in any number of areas within specialized fields of inquiry, the task of

identifying morally adequate behavior is left to highly trained experts who then impart their esoteric knowledge to the masses. Ophthalmic lasers are a "cutting edge" technology with a variety of complex moral issues. While experts can and should be employed in educating optometrists on the finer technical points in the use of these devices, no moral expert can sort out in advance all the moral complexities raised with their introduction. Values are not the specialized domain of experts. They are instead reflections of the corporate ethos of the communities in which they have been realized in the past. At the same time, the values a community — social, professional or otherwise — adopts, either consciously or unconsciously, will become constitutive of the kind of individuals who inhabit those communities both now and in the future.

There is a common failing in both the "sage advice" and the "moral expert" approaches to education in professional ethics. Each assumes that values education in general, and moral education in particular, can be packaged in discreet units, either by those with long experience in the field, or by those specially trained in such matters. These packages of moral insight are then distributed by teachers to uninitiated professional students in a formal classroom environment. This practice is not surprising since it is consistent with virtually all approaches to formal education. In effect, knowledge in general is treated as a commodity which can be packaged and delivered on a production line model. As new areas of educational need are identified, new discreet courses are developed and added to the curricula.

The production model of education is so firmly entrenched because in many areas of investigation it has in fact been highly efficient. In theory the student is exposed to a wide variety of subjects in a relatively limited amount of time. There are inherent problems associated with an expanding curricula as developments in the field lead to new "required" areas of investigation; students lament an ever increasing work load and educational administrators puzzle over how to fit all courses into an already over-crowded schedule. But in principle the dissemination of knowledge can be controlled much as one controls an assembly line. The problems, if and when they arise, are perceived as procedural rather than methodological. The task is to make appropriate adjustments in the system so as to accommodate the current need for the dissemination and acquisition of knowledge units. Hence when it is discovered that some training in professional ethics is required, the appropriate response is to add another module to the schedule. Moral knowledge is now treated like any other commodity that can be packaged and delivered in the same manner.

The inadequacies of the production model for moral education are obvious. Since moral knowledge entails reflection upon and adjustment in values as opposed to the acquisition of discreet units of information, it is not amenable to the modification and manipulation which the production model requires. While it may be possible to educate optometry students on the finer points of ocular therapeutics by adding another course to the curricula, it is not possible for students to acquire moral knowledge in the same way. Moral knowledge entails the acquisition of values, and is more usefully construed as a growth process than one of production.

. . . our society has experienced a significant decline in the general capacity for moral reasoning and ethical decision making.

A growth model of education acknowledges that individuals acquire requisite knowledge, skills and indeed values at different rates. It assumes that those involved in the process of growth come with varying understandings of the value domain, and with differing value priorities. Unlike the production model that seeks a particular educational product at the end of the line, the growth model assumes an ongoing process with varying degrees of influence on separate individuals. While the conditions of growth can be nurtured and encouraged by providing a suitable environment, growth itself cannot be controlled. Growth occurs; it is not made. A growth model concerns itself not so much with the individual acquisition of knowledge, but rather with the environment in which growth can occur.

How then would professional ethics be taught if a growth model were adopted by schools and colleges of optometry? Before concluding with some suggestions in this regard, a point of caution is in order. If when adopting a growth model one perceives optometry students as analogous to plants in a garden, and their "moral instructors" as gardeners who tend to their growth, there is little difference between the growth model and the production model discussed earlier. A more appropriate analogy would be to view the professional community — students, instructors, researchers and practitioners, ethicists and non-ethicists alike — as discrete parts of a complex organism. Each bears symbiotic relations to the others, and each is necessary to the proper functioning of the whole. Growth in values then becomes a community process.

A practical issue facing all schools and colleges of optometry involves finding the best method for including professional ethics education. While a production model favors a separate course on professional ethics, the growth model points toward a pervasive program in which ethical questions and values concerns are raised throughout the curriculum. In fact an appropriate approach should include both.

The complex issues facing professionals today require specific attention in their own right, and those trained specifically as ethicists have a great deal to contribute in this regard. Separate courses for students, seminars for instructors in the colleges and continuing education for practioners can serve valuable ends. At the same time, a community ethos truly conducive to growth in the kind of values a profession seeks for all its adherents can be achieved only if broader questions of social values are addressed at every level in the curriculum. The challenge facing optometry is to find effective means for implementing this kind of growth. ■

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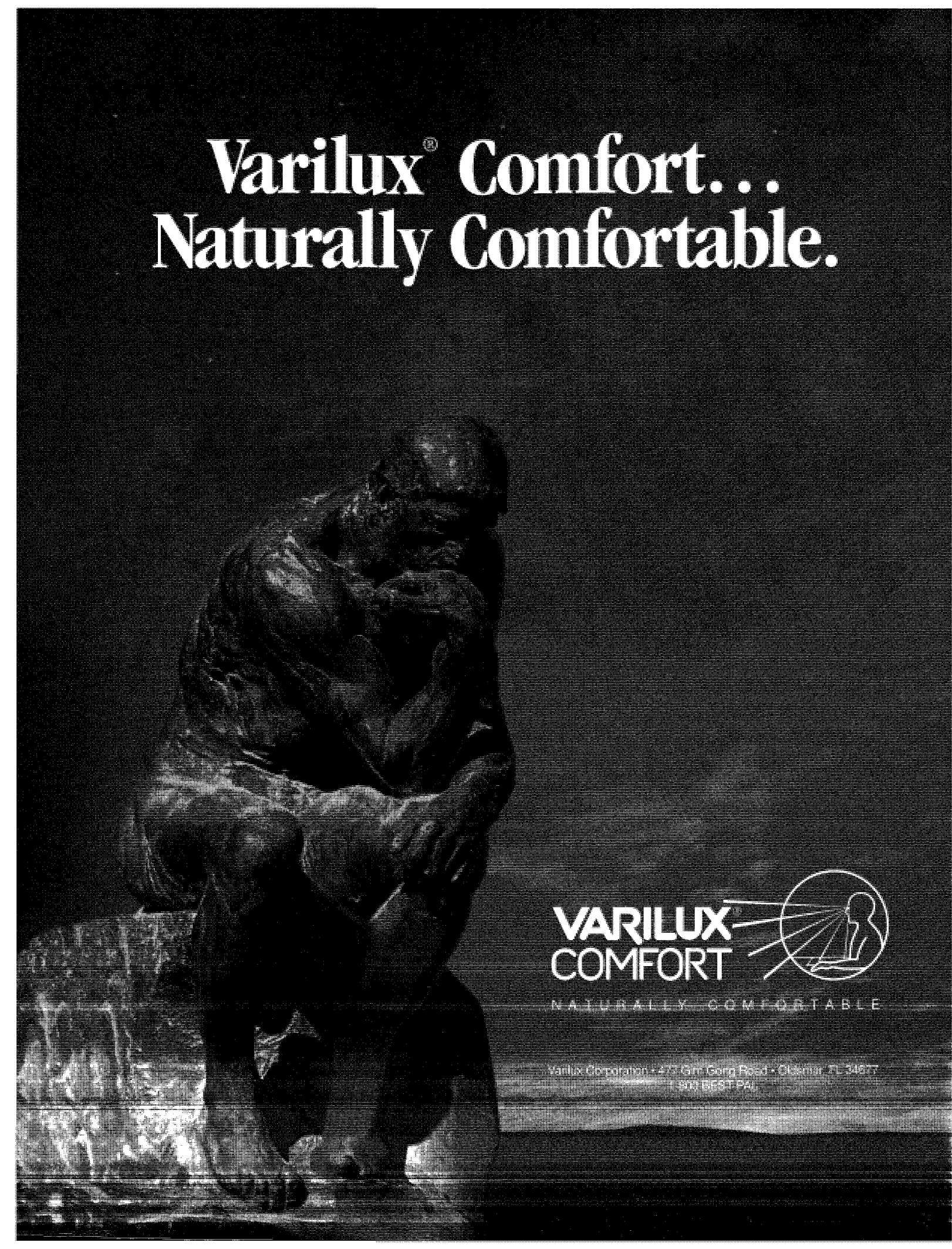

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