



L'ASSOCIATION des MEDIA et de la TECHNOLOGIE en EDUCATION au CANADA
ASSOCIATION for MEDIA and TECHNOLOGY in EDUCATION in CANADA



The Educational Media
Producers and Distributors
Association of Canada

L'Association des
Producteurs et distributeurs
du media d'éducation
du Canada

Suite 1201, 100 Adelaide St.W.
Toronto, Canada M5H 3S1

AMTEC Achievement Award Call For Nominations.

A. General

1. The AMTEC Achievement Award is in the form of and engraved plaque or plaques awarded annually by AMTEC.
2. The AMTEC Achievement Award is sponsored by the Educational Media Producers and Distributors Association of Canada (EMPDAC).
3. The Award is made to up to five recipients per year. If the recipient is a group, each member of the group receives a copy of the award. A group receiving an AMTEC Achievement Award is considered one recipient.
4. The Award is presented in recognition of outstanding ability in promoting the use or creative development of audio visual materials in the classroom in the kindergarten, elementary, secondary, post-secondary or training environments. The successful recipient(s) will have made a significant contribution to the learning process employing audio visual materials in the classroom.

B. Implementation

1. The Spring issue of the Journal will carry a request for nominations. The Awards Committee will receive nominations in time for its recommendation to be considered for approval at the February Board meeting of the AMTEC board. It will be the responsibility of the Awards Committee Chairman to submit the notice to the Journal editor. The notice must include an address to which nominations are to be sent.
2. Nominations may be made by any member of AMTEC or EMPDAC.
3. Nominations are made by the nominator submitting a letter to the AMTEC Achievement Award Chairman. The nominating letter and accompanying documents should indicate the following:
 - i) the name address and telephone number of the nominator.
 - ii) the name, address and telephone number of the nominee.
 - iii) a brief biographical sketch of the nominee.
 - iv) a comprehensive project description including:
 - a) the purpose of the project
 - b) implementation and timeline details
 - c) a brief overview of the content of the project
 - d) the utilization strategy and/or creative development
 - e) evaluation of the success and/or results of the project.
 - v) names, addresses and telephone numbers of three individuals who are familiar with the project and are willing to act as references for the nominee.

C. Awards Committee

1. The Awards Committee will be appointed by the AMTEC Board and will consist of at least three persons, one of which will be a present member of AMTEC Board.

D. Presentation

1. Recipients of the AMTEC Achievement award will be notified in writing following the February Board meeting and prior to the Annual Conference.
2. The presentation will be made at the AMTEC Annual Conference Awards function, by a representative of EMPDAC.
3. The first issue of the Journal following the Conference will carry the names of recipients of that year's AMTEC Achievement Awards.
4. As soon as convenient, AMTEC and/or EMPDAC may publish a paper or summary of a paper on the recipients' outstanding achievements.

If you would like to submit a nomination for an AMTEC Achievement Award, forward documentation detailed in B.3. (noted above) to:

W.R. Hanson
AMTEC Achievement Award Chairman
c/o Media Services Group
Calgary Board of Education
3610 9 St. S.E.
Calgary, Alberta T2G 3C5

Rationale and Procedures for Developing Instructional Media Programs

Yolande Tremblay

What happens in the thought-process of the learner when he is using different media? What particular features of the coding elements are responsible for the improvement? We don't know! So it would be important to include the participation of the learner in the evaluation of the product along with the development of instructional media.

This work is a tentative suggestion of procedures for developing media programs. It will contain two parts: the first part will establish a rationale for the development of media programs, and the second will present some stages in the development of media software with applications in photography.

Rationale

The rationale of this exploratory study is based on the work of Gavriel Salomon and Wilbur Schramm. Establishing the current state of knowledge is important since it will allow us to lay the groundwork in the development of media software.

We will examine the beliefs and propositions of Salomon related to the compensatory model, to the verbal and visual systems with varied degrees of notationality. Then we will present the concepts of iconic, verbal and analogue codes, according to Schramm.

Salomon's Work

Salomon advances a theory relating media symbol systems to learning and thought-processes, and so offers some propositions about the mental skills enhanced by coding elements (1979). He increases the fundamental understanding of mental operations required by media use.

Compensatory Model

Salomon's work in the field of media software is the most important for understanding the relationship of media to cognitive processes. His major propositions relate to the role of media symbol systems in the cognition and development of intellectual skills (1979).

Salomon's compensatory model suggests that learning is improved when translation processes are short-circuited or circumvented

to compensate for the learner's weaknesses. For instance, a medium such as television improves learning in the measure that its symbolic elements help to short-circuit difficult mental operations that human beings could hardly go through on their own (1971).

Thus, in the process of instruction, for effective communication, the cognitive demands of a task have to be matched with the skills required by the coding elements, and the level of the skills mastered by the learner.

Verbal and Visual Systems

According to Salomon, a verbal mode of presentation will facilitate performance especially if a person is more or less capable of producing the requisite verbalization on his own. An appropriate verbal presentation can open doors and arouse the desire for the acquisition of knowledge.

The cognitive development plays a special role in determining the quantity and quality of intellectual translation necessary for comprehension. Salomon argues that young children seem to be in need of transforming verbal messages more often into nonverbal representations, while older children process verbal messages directly and seem to convert less (1979).

Pictures may have the possibility of communicating more and better because their symbolic codes are closer to the internal representation that the learner must generate, according to his cognitive make-up and to the demands of the task. For example, if a learner is more proficient with a pictorial presentation, a verbal one may be more demanding and vice versa.

Notationality

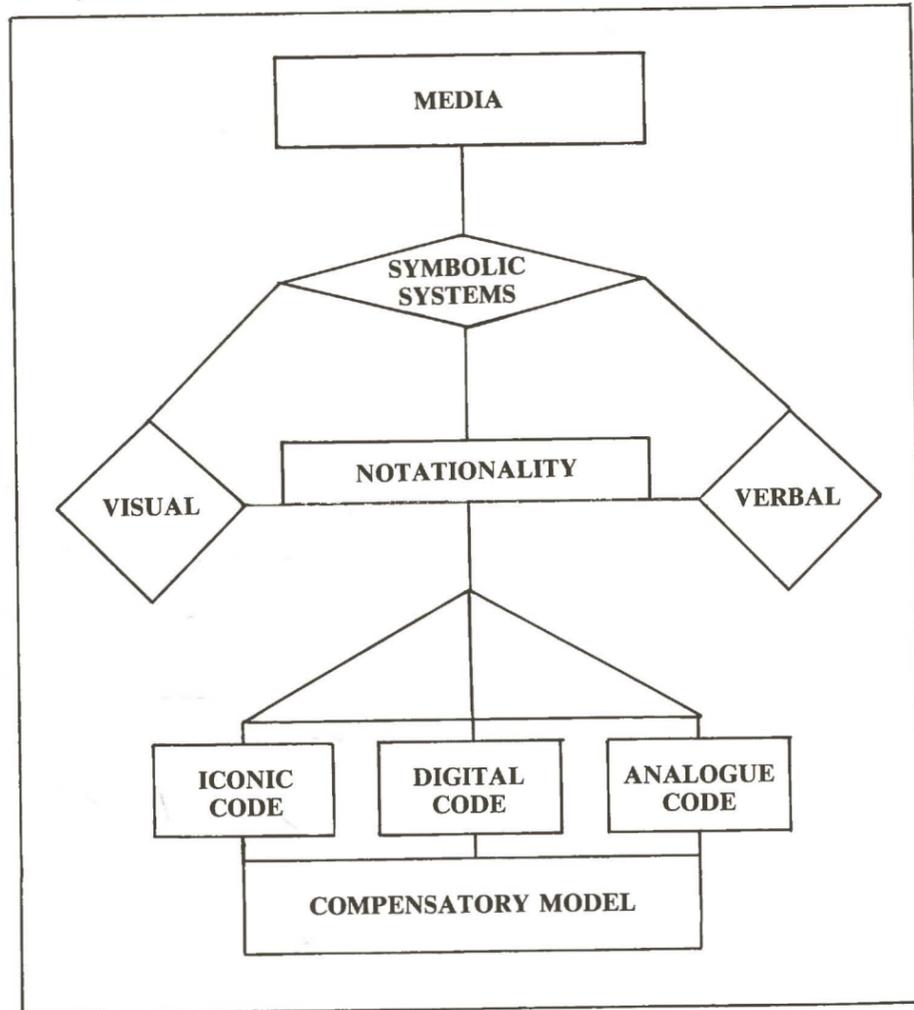
Another concept that deserves to be examined in Salomon's work is "notationality". To be notational, a system must contain elements which have segregated and disjoint referents, with a one-to-one correspondence between them. For instance, a musical score would be a notational system, and language is partially notational since it involves many ambiguities (1979).

Examples to illustrate this aspect could be placed as below:

Notational	Non-notational
Musical score	Photograph
Language	

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Figure 1.
The compensatory model with media symbolic systems.



Salomon hypothesizes that non-notational symbol systems require fluid ability, and notational symbol systems require crystallized ability. Even if it seems hard to discover which type of recording abilities is demanded and by which symbol system, it is important to explore this field of knowledge that offers interesting issues.

Schramm's Concepts

Schramm also helps to understand and to advance a better use of educational media software. His work is worth examining for the purpose of guiding the research.

Digital Code

Schramm borrows the name "digital" from the computer and he gives some features of the digital system used by the printed media: it can present pre-packaged information quickly, however, it offers only a few cues but a lot of possible combinations. Equally, the digital codes (print, spoken language, mathematics) are used in the learning of basic mental skills (1977). It may lead the user from abstraction to assigned meanings. So it helps the learning process for people able to handle abstraction.

Iconic Code

The iconic code of pictures exhibits con-

trasts with the digital system. Simple visual information may be assimilated all at once. The learner is encouraged to move around and pick out the cues that interest him.

This code is concrete and invites the individual to wander from it to meanings he can extract and verbalize when necessary. In the human brain, the iconic impressions are often intense and resilient to loss.

Analogue Code

Analogue code originated from the digital and analogue computer, but is nearer to the iconic code. For example, in spoken language, there are analogue elements: tone, rhythm, voice quality, and so on. The differences between iconic, digital and analogue codings are just beginning to be understood. So the theory for the best use of these coding systems must emerge in the future (1977).

The current research on instructional media software requires continued studies on content, how learning is acquired by the human being, or what aspects have helped in the process of developing skills or acquiring knowledge. Schramm, as well as Salomon, emphasizes the symbolic systems of the media that could affect learning. Figure I shows a synthesis of their points of view.

Development of Media Software

In the development of media software, efforts must be concentrated in order to know how the learner is processing the knowledge he is acquiring, and how he is developing skills. We need to examine the psychological consequences in the use of symbolic systems to provide the necessary mediators in a compensatory approach.

In this second section, we suggest some stages for the development of media; the model to be used is inspired by the Instructional Development Institute, and it will be applied in photography.

First, the behavioral objectives must be defined, and some target audience characteristics need to be identified; then the concepts to be taught will be planned, and a rough design for presentation strategies will be prepared. A formative evaluation will be proposed to revise the design before finishing the production and making the summative evaluation.

Behavioral Objectives

In a module formulated in photography, we emphasize "thinking", so that the objec-

tives are in the cognitive domain. To attain them, a compensatory model could be applied with coding elements, specifically adapted to the visual system, and aided by verbal and analogue symbolic codes of varied degrees of notationality.

In a work like photography, two levels of performance objectives should guide the process:

A terminal performance objective that the learner should have reached at the end of the course: the student should be able to analyze factors which express some ideas or feelings in pictures, to apply procedures in taking pictures and to synthesize his knowledge in order to communicate ideas and feelings by means of photography.

Some enabling objectives or sub-objectives which state the essential behaviors for the learner, to achieve the terminal performance objective:

The student enrolled in the Photography Class I, should be able:

- To itemize some principles of photography when given a written test;
- To analyze factors expressing an idea or a feeling, when shown pictures and given a written test;
- To translate verbal systems of photography into symbolic statements and vice versa, when given a written test with pictorial matter;
- To apply the procedures for taking pictures as judged by a committee, when given a 35mm camera and black and white films;
- To synthesize understanding about photography for expressing specific ideas or feelings when taking pictures with a 35mm camera and color film by a committee.

We know that objectives often surpass one another but the thing to look for is the main emphasis of the objective, and here, we could deal specially with what a student should know and comprehend about principles of photography in order to solve problems quickly when taking pictures for a specific objective or a particular task in a class.

Target Audience

Some characteristics of the target audience deserve to be identified in an attempt to apply a compensatory treatment in a special task. For instance, it is important to discover how people with fluid abilities or crystallized abilities react with some specific coding elements. Can they instantly form visual images to anticipate a kind of picture, or do they depend upon verbal strategies?

To demonstrate the processes of taking pictures with variable depth of field, do they

use two screens differently for a visual display?

In order to render a special idea, are diagrams of the inner part of a camera helpful to understand the result of different combinations of speed and aperture?

We think it is very important for a teacher to be able to adapt his teaching methods to the varied skills of the young people and to help them develop their abilities in different fields. An instructor who could master only verbal system or only visual system, would be limited in his means to face learners whose aptitudes require other treatments.

To facilitate successful learning we need to assign methods to students on the basis of prior knowledge of their abilities. Thus, pertinent learners' differences must be taken into account as factors in media software development.

Concepts to be Taught

When deciding upon concepts to be taught, it is important to consider the desired results for the respective learners. For instance, to learn some generalities about photography, the individuals involved should develop skills that enable them to operate effectively under various circumstances, which require similar abilities: analyzing visual displays, comparing spatial elements, synthesizing factors and applying them, in the solving of problems, etc.

The compensatory model looks for isomorphism between the presentation of concepts by coding elements and representation to the learner's intellect. Media are vehicles and we have to discover how, under the best conditions, they convey concepts that comply with the mental process.

It is possible that some people learn about photography faster and better if the message is presented through a digital code and the degree of abstraction conducted through syntax and vocabulary.

In photography how could the non-notationality of a picture help a student understand depth of field? To communicate a special feeling in a picture, and in order to unite many factors as aperture size, length of exposure, distance of the object, etc., in what measure would a student need a more notational system, for instance, verbal language?

To cognitively understand photography, would it be helpful to use diagrams that may be more notational than pictures? We need to understand how different degrees of notationality interact in the learning of concepts.

The isomorphism with internal representation has to be examined in order to save useless mental elaborations while assuring efficient learning.

Presentation Strategies

Understanding the principles of photography permits us to convey ideas or feelings in pictures more adequately. And for a teacher who wants to learn to produce, analyze and use pictures with children, it is necessary to be able to communicate a message by visual system as well as by a verbal one, in order to adapt his teaching to the aptitudes of the learner. We know that the cognitive development varies with regard to the age. According to the subject matter it requires a more or less higher degree of concreteness and abstraction.

In fact, photography is not just a matter of technique, but really a question of aesthetics. Thorough observation, awareness of the environment, and technical expertise are necessary to convey different messages.

The feeling which has to be expressed requires proper combination of light and precision on image. If someone desires to reveal joy, softness, tenderness, he will not portray sadness, or inspire pity. Certain conditions of light or kinds of films are more appropriate than others to convey a particular feeling.

Also, if one wants to isolate an object or a person on a picture, he will use a different technique when he wishes to present them in a large context and vice versa. He can vary the depth of field, choose a slow or a fast film, select adequate speed combined with appropriate f-stop.

Design

A rough design is prepared in order to achieve the desired outcomes.

We think that a slide-tape could illustrate the principles of photography. A sequence on video-tape could demonstrate the procedures used when taking pictures. For the application of general principles, a camera and a film could also be useful.

We suppose that learning can be enhanced when translation processes are circumvented or short-circuited for the learner. For instance, in photography it could be difficult to understand clearly the meaning of "light writing", but if explained with an adequate coding system, the process is presumably facilitated, with a correspondence between the coded message and the mode in which it could be best internally represented.

As the learner cannot see the transformation that occurs by the action of the light on the surface of the film in the black box of the camera, he has to reproduce in his mind the reactions that happen in different conditions for special purposes.

In the event of changing the stimuli when they seem to be more or less significant in the learning of the task, we need to ask and know what is going on in the learner's mind when presented these coding elements (iconic, verbal, analogue, etc).

Let us take some other examples to demonstrate what we mean. If the learner does not understand the concept "focus" in photography, we may assume that a diagram showing a lens and the pictures formed by objects (on the film, behind the film, before the film), could help to represent the information of images by objects located at different camera distances.

It would be possible to explain the "depth of field" by using only words, but very probably the presentation of some pictures illustrating different situations would be more efficient than long written descriptions of the subject. In this case, the verbal system could be a reinforcing strategy rather than a primary one.

In order to penetrate the meaning of a concept like "depth of field", we could use a double screen.

In written language, we think that underlining, capitalizing, directing attention with arrows, light pointers, could be ranged in the analogue code, and could be appropriate in photography learning. Understanding of the learners' cognitive process would enable the professor to select intelligently a compensatory treatment adequate for each student.

Presentation strategies is a means the teacher can use to compensate for some of the students' weaknesses in the development of skills or understanding. That could help to discover which particular features of the media software are responsible for the learning and which coding elements could produce the expected outcomes in the mind of the human being according to his specific abilities.

Evaluation

Since we consider the development of instructional media software as a constructive process, it is necessary to apply two kinds of evaluation: formative evaluation, to determine "en route" failure, and summative evaluation to assess success or failure of goal attainment.

Formative Evaluation

When the media software is being constructed, it has to be tested in detail by observational methods to assess whether or not learners are achieving, what they are making with the product and how they are organizing the material in their mind. This procedure puts the evaluation process at a time when its results can be used for correction.

For instance, if non-notational symbol systems require fluid ability, it is interesting to cultivate this kind of ability in the learning of photography. Observation, analysis of the space, the conditions of light, and combination of factors, like speed, distance, emulsion are required in order to produce some personal vision of the world.

We believe that to promote creativity, which is important in photography, the instructor has to present many divergent examples, to infer generalities, to model the procedures, to call for practice, to develop skills of thorough observation, internalization, etc. And above all the developer of instructional media software must know how the learners are proceeding mentally with the symbolic systems used in the cognitive process.

If visible finger movements are associated with verbal code, this can facilitate the internalization of the steps necessary to take pictures. But we must evaluate with the students these particular features of the media, and investigate closely how every coding element interacts with mental cognition.

As the media software is being built and experimented with a small group, some questions could help the professor:

- Describe your mental process for understanding the concept or principle.
- How do you develop your response?
- Do you verbalize to yourself when shown a picture? In what order?
- Give the step-by-step sequence you are using to analyze a complex picture.
- For problem solving, could you imagine what would happen and what it would be like? How did you determine your answers?

By means of these questions and the like, it would become possible for the teacher to know the different operations by which learning occurs in accord with various degrees of abilities in the learners, and so to assist the process by adequate compensatory treatments, and to adapt the notational systems that suit the best for the objectives of the task.

This formative evaluation will make us discover if our product is working or not, and what has to be modified in the final design. According to the needs of a compensatory approach and in response to the goals of instruction, we might find out that different versions are necessary.

Summative Evaluation

Finally, a summative evaluation involving a larger group of students will determine how the last version will realize the final outcome. After a period of instruction, some tests could be administered to the group. At a later date, another form of the test could be administered to assess the durability of the learning process and the effectiveness of the compensatory model as applied to the aptitudes and the respective methods employed.

Revised Design

When correctly applied, evaluation and revision reduce the need to spend time and money uselessly. A close observational and experimental method will permit one to assess and revise the production at a point where results will improve the media.

The final production will be concretized only after many trials and errors. Thus, this procedure presents a more realistic opportunity to foster learning. Rather than exclusively planned and prepared material by the instructor, and without the use of tests, re-tests and revisions, the above mentioned model allows for a direct to co-relation between the skills of the learner and the methods applied. Figure 2 presents the stages we suggested.

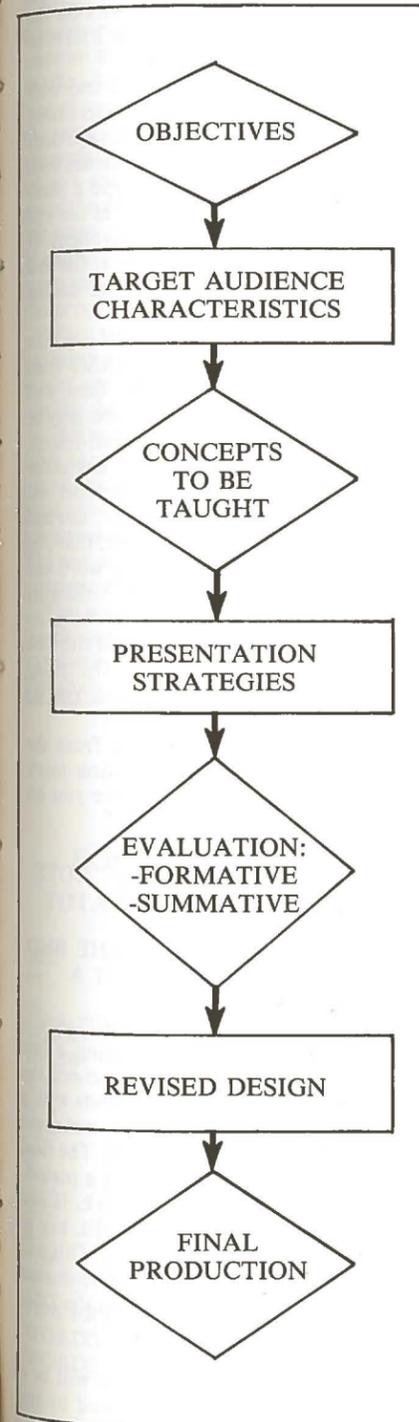
Conclusion and Recommendations

This brief study of the work of G. Salomon and W. Schramm allowed us to examine their thought about the symbolic systems of media. This appeared as an important rationale to lay the groundwork of media software.

We suggested some procedures to develop instructional media programs including the participation of the learner along with the preparation and evaluation of the product.

Much research and experimentation is necessary to discover the characteristics of the media related to the learning of specific tasks, and to know the ways of matching aptitude and treatment for enriching the stu-

Figure 2
Stages in the development of media software.



dent's cognition.

1. Some learners may be engaged in constructive activities, in beginning with pictures from which they will induce the principles.
2. On the other hand, some learners may be led in mental operations by presenting them with principles before giving examples by pictures.
3. We have to try different degrees of notationality to know when learning improves according to the types of learners engaged in the process, we should also use different degrees of notationality to facilitate mental elaboration.
4. To compensate for low aptitudes in a visual task, we may assume that using some plain diagrams and directing the learner's attention could help to demonstrate relations between concepts and thereby save mental operations.
5. When facing a task like photography with certain types of learners in a compensatory model, we have to know in which measure is a verbal system necessary.
6. Do the learners maintain their preferred strategy? We have to help them develop skills that would, in many cases, shorten the way and restrain useless activities.

References

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Salomon, G. "Heuristic models for the generation of aptitude-treatment interaction hypotheses." *Review of Educational Research*, 1971, 42, 327-343.

Schramm, W. *Big media, little media*. (Tools and technologies for instruction). Beverly Hills, California: Sage, 1977.

Of Interest

Computers Anyone?

AMTEC members who would like to form a special interest group in computers, computer technology and software should contact Mr. Ron Eyre. Mr. Eyre will help to organize a SIG in Microcomputers in Education.

To obtain further information and to express interest contact:

Mr. Ron Eyre
Wellington County Board of Education
500 Victoria Rd. North
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N1E 6K2

14th Annual Conference on Visual Literacy
Vancouver, British Columbia
Nov. 17-20, 1982

"Seeing Ourselves — Visualization in a Social Context" is the theme for the fall visual literacy conference. The 1982 conference will explore the process in film, television, still photography, architecture and other visual media.

Keynote speakers include John Culkin, founder of the Centre for Understanding Media; Freeman Patterson, world famous photographer; and John Hirsch, director of Stratford Shakespearean Festival.

For further information, please contact:

Dr. Patricia Groves
Sociology Department
Capilano College
2055 Purcell Way
North Vancouver, B.C.
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CJEC's New Editor

Dr. Denis Hlynka will assume the editorship of the *Canadian Journal of Educational Communication* on July 1, 1982. Dr. Hlynka is an Associate Professor in the Faculty of Education at the University of Manitoba. He holds a Ph.D. in Instructional Development and Technology from Michigan State University. He has published articles in many Canadian and international journals.

Dr. Hlynka will edit his first issue (Volume 12, Number 1) during the fall. The deadline for material for that issue will be August 1, 1982.