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ABSTRACT

This paper tells the story of Sister Mary Theresa Brentano, O.S.B's (1902-1987) innovative use of magnetic audiotapes to provide instruction for students in grades K-12. From 1952 to approximately 1968, Brentano implemented, refined, and tested her tape teaching methods with special emphasis on individualizing instruction in the elementary school. Brentano's innovative tape teaching ideas are not mentioned in Saettler's "The Evolution of American Educational Technology" (1990), DeVaney's "Voices of the Founders: Early Discourses in Educational Technology" (1996), or Butler's "Women in Audiovisual Education, 1920-1957: A Discourse Analysis" (1995). This paper provides an interpretive biographical look at Brentano's tape teaching innovation. It discusses her rationale for and implementation of tape teaching and shares some of the successes and struggles of tape teaching. The paper concludes by discussing two ways this research into Brentano's individualized tape teaching innovation benefits the field of educational technology. (Contains 29 references.) (AEF)

Sister Mary Theresa Brentano, OSB's Innovative Use of Magnetic Audio Tapes: An Overlooked Story in the History of Educational Technology

By: Linda Herndon

Sister Mary Theresa Brentano, OSB's Innovative Use of Magnetic Audio Tapes: An Overlooked Story in the History of Educational Technology

Linda Herndon, O.S.B.

"The keenest disappointment of our trail blazing would be that we could not fit into the picture of new developments."
from Brentano's daily journal calendar, January 5, 1959

Introduction

In this paper, I tell the story of Sister Mary Theresa Brentano, O.S.B.'s (1902-1987) innovative use of magnetic audio tapes to provide instruction for students in grades K-12. From 1952 to approximately 1968, Brentano implemented, refined, and tested her tape teaching methods with special emphasis on individualizing instruction in the elementary school. Brentano's innovative tape teaching ideas are not mentioned in Saettler's *The Evolution of American Educational Technology* (1990), DeVaney's *Voices of the Founders: Early Discourses in Educational Technology (1996),* or Butler's *Women in Audiovisual Education, 1920-1957: A Discourse Analysis* (1995). In this paper I provide interpretive biographical look at Brentano's tape teaching innovation. I discuss her rationale for and implementation of tape teaching and share some of the successes and struggles of tape teaching. I conclude by discussing two ways my research into Brentano's individualized tape teaching innovation benefits the field of educational technology.

Sister Mary Theresa Brentano, O.S.B. was a Benedictine Sister of Mount St. Scholastica in Atchison, Kansas.[1] In June 1933, Brentano, a member of the Phi Beta Kappa honor society, received the first Ph.D. in English awarded by the University of Kansas ("City News," 1933). After receiving her Ph.D., Brentano returned to the college run by her religious community, Mount St. Scholastica College[2] in Atchison, Kansas, as head of the English Department.

Sometime during the 1947-48 school year, Mother Walburga (Anna) Franz, Prioress of St. Scholastica Priory, Covington, Louisiana, came to Atchison, Kansas, to confer with Mother Lucy Dooley, Prioress of Mount St. Scholastica, about the possibility of sending a few Sisters to Covington. Franz wanted some sisters from Atchison who had their Ph.D. to go to Covington to help the sisters maintain state certification of their school, St. Scholastica Academy, by teaching some classes to their sisters. Brentano was one of two sisters from Atchison who volunteered to go to Louisiana in the fall of 1948.

The Inspiration for Tape Teaching

Sometime in 1952 while she was principal of St. Scholastica Academy in Covington, Brentano and Franz went on a trip to New Orleans. While riding in a taxicab there, Brentano noticed that the cab driver could call his headquarters to get his orders to find out who to wait for and where. Brentano got the idea that if the taxi driver could talk over the intercom and communicate with headquarters, then why couldn't this same technology be used in a single classroom with the different students hearing the teacher whenever she talked to them. (M. P. Ege, OSB, personal communication, November 6, 1999)

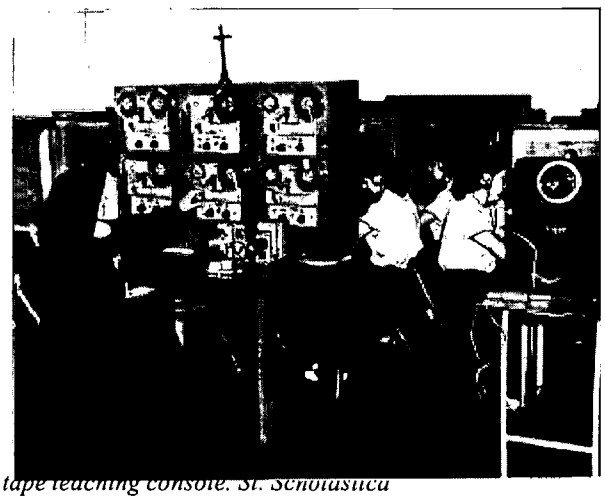
With the full support of Franz, Brentano set about to make her germ of an idea for individualized tape teaching a reality. Having previously observed the use of tape recorders and earphones to teach graduate students foreign languages ("Classroom electron," unknown; Stoma 1957), she decided to use this technology to provide the individualized instruction that parents were requesting for their daughters and sons. Although we now think of individualized instruction as meaning each child is taught according to his or her needs, for Brentano individualized instruction meant that a child's individual needs were important, but for instructional purposes, the child is grouped with other children who have similar needs. She referred this method as "individualization within the group" (1959). Brentano described individualized tape teaching as "probably the greatest aid now available for taking care of individual differences in the classroom" ("Sisters Prepare Tape Recorded Lessons," 1954?). The huge increase in the student population as the Baby Boomers started school created a teacher shortage and individualized tape teaching was touted as a possible way to help to alleviate this problem.

Tape Teaching–What It Is and How It Developed

A class period taught using Brentano's individualized tape teaching methods was divided into three sections of about 20 minutes each (Keating, 1961). During the first section of the class period, the teacher introduced the class's topic. The teacher then divided the students into four ability groups. While three groups used earphones to listen to tapes prepared by their teacher on the topic, the teacher worked with the fourth group that needed extra help. The brightest students heard on tape how to apply what the teacher had presented. The average students got some clues or reminders about how to apply what was presented while the slow learners had the entire lesson repeated, possibly more than once (Stoma, 1957). The last section of the class period was a total-class discussion where students had a chance to share what they learned from listening to the tapes. A former tape teacher

shared with me that Brentano encouraged her to make sure that the low ability students always had some information on their tape that the other groups did not have (T. Balot, personal communication, March 24, 2001). In this way, the lower ability students could always participate and contribute something special to the class discussion.

Ideally, only the teacher knew to which ability group she or he assigned a given student. The reason for this was to remove the stigmas that can go with the grouping of students (Stengren, 1958). These ability groups did not need to be the same for every subject (Dickerson, 1958). For instance, a student could be in one group for arithmetic and a different one for English. The teacher could change the student from one group to another during the school year and the student could also request to change groups (S. Ross & Kiester, 1958, and Brentano notes). From interviews with tape teachers, all shared with me that in practice students *did* know to which of the four groups they were assigned.



gure 2. First tape teaching console. St. Scholastica ademy. 1952.

In the fall semester of 1952, a class of primary student first used earphones and tapes in a room with 30 listening booths and six channels of tape (S. M. T. Brentano, O.S.B., 1962, p. 368) (See Figure 2). Brentano believed that providing primary grade children with the best education possible was important since that was where their foundation in education began (M. K. Taylor, OSB, personal communication, January 12, 2000) and she believed that "small pupils were being slighted in their American technological heritage" (Laube, 1958). Figure 2, the oldest dated photograph of tape teaching, requires some explanation. This photograph shows a six-tape console being used by a teacher. When Brentano originally started tape teaching, she used six different tapes. It seems that experience proved that three tapes were as effective as six and required much less preparation for the teacher. The photograph shows high school girls, not elementary school children, in the carrel-style listening booths. Several newspaper articles in the fall of 1954 ("Electronic Classroom," 1954; "Sisters Prepare Tape Recorded Lessons," 1954?; "Tape-recorders, books team up in first U.S. 'Electronic Classroom'," 1954) have photographs that show this classroom being used to teach primary grade girls and boys. Brentano coined the term *Electronic Classroom* to refer to this room since she said it did not seem appropriate to call it a laboratory with first and second graders using it (date unknown).

Brentano's individualized tape teaching innovation evolved with experience. One of the first additions to tape teaching was the use of a worksheet to accompany the tape. As Brentano explained (1962),

> On tape the child never merely listens. He will listen, learn, and on his worksheet record the fruits of his mental activities both for his own help in review and his teacher's evaluation of this achievement....On his worksheet he will likely be asked to write answers that relate the lesson to his past experience, to give the result of his observations, and to carry his observations forward until he can infer from facts some generalization or principle . . . and finally correct his paper by noting the answers which the tape will give him. (p. 369)

Since the six-track individualized tape instruction electronic classroom was popular with both teachers and parents, there was a need to create another tape teaching classroom. The second iteration of the tape classroom was built in 1953 and it provided a less expensive alternative to the original electronic classroom (See Figure 3). In this classroom, conduits that held the lines from the tape recorders extended between the rows of desks. While seated at their desks, the children plugged their earphones into a jack box in the conduit and could listen to the tape without having to be in special listening booths (date unknown).

Figure 3. Second iteration of tape teaching classroom. Sister Maris Stella Pravata (Maris Leitz) is the teacher. Date unnknown.

Figure 4. The third iteration of the tape teaching classroom. On Pravata's desk is a microphone and a switch box. Photo by Petit's Studio. Date unknown.

The third iteration of the tape classroom (See Figure 4) developed later involved the addition of an intercom system by which the teacher could contact an individual student without disturbing the rest of the class. Brentano described needing an intercom as a way to get the attention of an inattentive student as well as to determine if a student could properly hear the tape. The first intercom system allowed only one-way communication–from teacher to a student (Laube & Brentano, 1957). Figure 4 shows a tape teaching classroom complete with the microphone by which the teacher could contact individual students. To contact an individual student, the teacher had a set of switches that allowed her tap into the same line as an individual student.

Our Lady of Wisdom Hall–The First Electronic School

The success of tape teaching resulted in an increased enrollment at St. Scholastica Academy. In 1957 to provide more classroom space for the larger enrollment and to meet the needs of Brentano's developing tape teaching innovation, the Benedictine Sisters built Our Lady of Wisdom Hall. *Newsweek* ("Electronic classrooms," 1957, p. 99) referred to Our Lady of Wisdom Hall as "the first structure in the history of American education to be specially designed and pre-wired for electronic teaching." Our Lady of Wisdom Hall, a one-story, air-conditioned, three-classroom building, cost $75,000 of which $15,000 was for the electrical features ("Classroom electron," unknown). Two classrooms, that Brentano called Classroom Electron I, were somewhat traditional looking with individual desks and the other classroom, Classroom Electron II, had 32 individual recitation booths as well as desks. There was a fourth and much smaller room called the individual measurement room.

Classroom Electron I

At first glance, each of the two identical Classroom Electron I's looked like traditional classrooms (see Figure 5). One noticeable difference is that on the floor beside each desk is a recessed receptacle into which a student plugged in a set of earphones. This innovation, designed by Brentano, eliminated the raised conduits with wires in the aisles between the students' desks. The second special feature was that the teacher's desk was replaced by a special six-foot long console that includes four heavy-duty Viking-75 tape recorders ("Electronic age school," 1959), a set of control switches for each student's desk, and a headset with a microphone for the teacher (see Figure 6). The four reel-to-reel audio tape players allowed the teacher to present up to four different taped lessons at any given time. Besides the three tapes used for instructing three different ability groups, the fourth tape recorder was available for a variety of purposes: a special lesson for highly accelerated students, a remedial lesson, a make-up lesson replaying a tape missed a previous day, or as a replacement tape recorder if one of the other three recorders was not working correctly. The toggle switches shown in Figure 6 allowed the teacher to select which of the four tapes each individual student heard.

Figure 5. Classroom Electron I. While Pravata instructs some students others are using earphones for taped instruction. Photo by Petit's Studio. 1957.

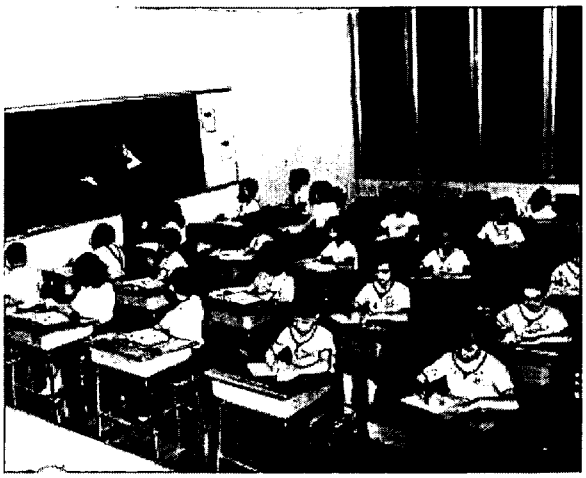


Figure 6. Classroom Electron I teacher's console. Sister Anthony Balot (Toni) adjusts the switches to set which tape a student hears. Photo by Petit's Studio. 1957.

Clasroomsroom Electron II (or the Booth Room)

The single Classroom Electron II (or Booth Room) in Our Lady of Wisdom Hall was equipped with desks in the middle of the room and a total of 32 soundproof individual recitation booths along twosides of the room (see Figure 7). The desks permit the teacher to work with a small group of students while the other students are working in their own recitation booths. Each booth had a writing shelf, one or more chairs, a set of lightweight, removable earphones, a two-way intercom speaker, and a light. In each booth there are four possible openings into which to plug the earphones. This allowed the teacher to select audio from one of the three tapes, a record on the phonograph, or a radio program depending on what she or he wanted the student to hear. A switch in each booth allowed the student to contact the teacher by turning on a light on the annunciator panel on the teacher's console (see Figure 8). The teacher, through the use of her headset at the console, could answer the student's question privately without disturbing anyone else. The use of the headset also allowed the teacher to listen in on what was going on in any of the booths without disturbing the student ("$40,000 Ford grant enables college to test new electronic teaching system," 1958; Sherman, 1958).

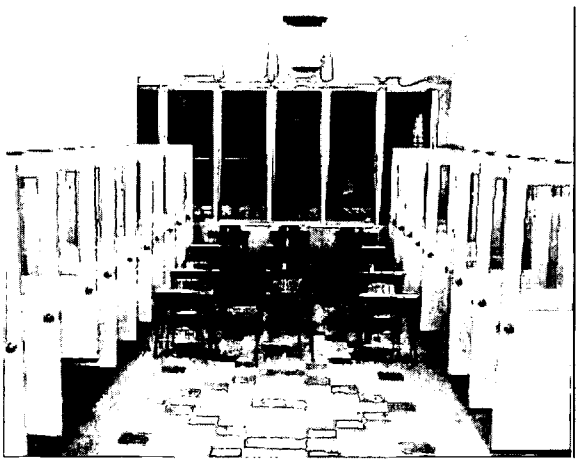


Figure 7. Classroom electron II. Photo by Petit's Studio. 1957

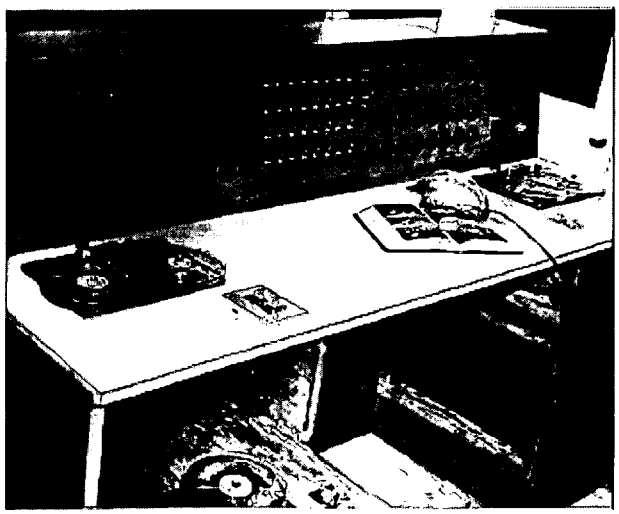


Figure 8. Classroom Electron II teacher's console complete with 3 tape recorders, record player, annunciator lights Switches for each of the 32 booths and teacher's headset.

Stoma (1957) reports that there was an individual measurement room in Our Lady of Wisdom Hall where the teachers posted records of each student's progress and of each class's achievements. The original plan was that this small room would be used as a research laboratory in which the teachers could study how a child actually learns. From what I could ascertain from conversations with former tape teachers and from Brentano's notes, the individual measurement room was never used for anything other than a place to post test results. It is likely that the primary reason for this is lack of development of the individual measurement room is that Brentano returned to Atchison, Kansas, at then end of August 1957, only months after Our Lady of Wisdom Hall opened.

1957 Summer Tape Workshop

Late in May of 1957, the Ford Foundation Fund for the Advancement of Education awarded Brentano $15,000 to conduct a six-week Tape Workshop in Our Lady of Wisdom Hall during the summer of 1957 (Fine, 1957). At the workshop, Brentano taught teachers how to implement her tape teaching methods in their own classrooms including how to write scripts, record tapes, and make worksheets. A total of 36 teachers, all members of Catholic religious communities, attended the workshop and made tapes in geography.

The Tape Institute at Mount St. Scholastica

In August 1957, Brentano returned to her home religious community of Mount St. Scholastica in Atchison, Kansas, to set up and run the Tape Institute. With more than $100,000 in grants from the Fund for the Advancement of Education over a three-year period, $23,000 from the Raskob Foundation for Catholic Activities, Inc., and with space and financial assistance from Mount St. Scholastica College, the Tape Institute was the center of Brentano's tape teaching innovation until the mid 1960s. The Tape Institute was responsible for creating more than twelve thousand tapes, scripts, and worksheets in all different subjects for all grades and distributing them to schools using Brentano's methods around the country. Most of these tapes were created by the teachers who attended the four summer tape workshops from 1958 to 1961. The Tape Institute was also responsible for coordinating the standardized testing done in tape schools and their counterpart non-tape schools to provide for statistical measures of the success of tape teaching.

By 1957 the following schools had adopted Brentano's individualized tape teaching methods:

- St. Scholastica Academy, Covington, LA: 5th through 8th grades
- Mater Dolorosa School, New Orleans, LA: 2nd grade, remedial reading
- Cathedral School, Lafayette, LA: 8th grade
- De La Salle Normal School and Junior Novitiate of Brothers of the Christian Schools, Lafayette, LA: social studies and chemistry
- Our Lady of Fatima School, Lafayette, LA: 6th grade
- Immaculate Conception School, Grand Prairie, TX: 4th grade, reading clinic
- Incarnate Word School, San Antonio, TX: 1st grade
- St. Joseph Cathedral School, St. Joseph, MO: 3rd and 6th grades

In 1958 there were 45 rooms in 16 schools using Brentano's tape teaching methods and by 1960 there were electronic classrooms in 80 schools (Keating, 1961, p. 20).

The Benefits of Tape Teaching

According to Brentano (1962, p. 369), there were four main benefits for students taught using individualized tape teaching. The first benefit was that tape teaching fits student's needs because the students listened to tapes especially made for their ability level. If a student needed special attention, then the teacher provided that while the rest of the class listened to tapes.

A second benefit was that tape teaching presented superior instruction since it was the goal of the teacher making the tape "to present the best material in the best way, so that the pupils who learn it will be equipped to live successfully in their world" (Knoedel, 1958). Tapes were not merely to repeat a textbook, but were to be creative, interesting, up-to-date works of art worthy of keeping and using again and for sharing with other teachers.

The third benefit of tape teaching was that students learned to concentrate better. According to Brentano, one reason for improved concentration is that the use of earphones created a feeling of a more personal contract with the teacher. "The hearing of a lesson on earphones is a much more intimate experience than hearing a tape played aloud. With this information going into the student's ears, and his eyes occupied with the worksheet, the attention is truly phenomenal" (personal notes of Brentano). Directions were given at the beginning of the tape. Since the tape did not repeat directions, students soon learned that if they missed the directions, they were out of luck since the teacher would be busy instructing another group and could not be interrupted. Throughout the tape, the student had to listen carefully in order to answer questions on the worksheet. At the end of the tape, answers to the worksheet were given and the student had to continue to pay careful attention to make sure s/he graded the worksheet properly.

The fourth benefit Brentano (1962, p. 369) listed for tape teaching is that it allowed the student to have more personal contact with the teacher. A former tape student told me that when she listened to a tape, she felt like the teacher was talking directly to her. Brentano claimed that tape teaching multiplied a teacher's voice and personality since she or he was really teaching four classes at a time–not just one. This allowed teachers "*more* time for discussion, *more* time for questions, *more* time for individual help" (emphasis original) (S. Ross & Kiester, 1958). Brentano strongly believed that tapes were not meant to replace a teacher, but were meant to supplement her by multiplying her presence in the classroom (M. T. Brentano, O.S.B., 1959; Keating, 1961; "Tape-recorders, books team up in first U. S. 'Electronic Classroom'," 1954; "What is a tape-teaching workshop?," unknown).

Tape teaching often produced impressive test results. For instance, of the 100 elementary students at St. Scholastica Academy who were taught using Brentano's tape teaching methods during the 1956-57 school year, only one student failed to average the ten-month expected gain on the Metropolitan Test. "Twenty-five averaged a gain between one and two years; fifty-five averaged a gain between two and three years; eighteen a gain between three and four years, while one surpassed the equivalent of four years' gain as measured by standard norms" (Laube, 1958, p. 13).

Some Problems and Challenges of Tape Teaching

As with all innovations in educational technology, tape teaching had its share of challenges and problems. In this section I briefly describe many of these challenges. One problem with implementing tape teaching was the cost of setting up an electronic classroom, the ongoing cost of maintaining it, and the cost of paper for worksheets. In 1958, Brentano estimated that a school could equip a classroom for tape teaching for $3000 (B. Ross & Ross, 1959). If the funds were available, a major problem was finding an electrician who could build and wire the specialized console since these were not available commercially. Tape teachers often shared with me that equipment did not work properly, i.e., tape recorders broke frequently, students couldn't hear with their earphones, headsets picked up radio programs rather than the tapes, etc. The quality of the recordings often made it hard to hear and understand a lesson.

Although tape teaching was supposed to give the teacher more time, tape teachers in the first years of the innovation found this to be anything but true. Since there were no scripts, tapes, or worksheets, the classroom teacher had to do all this herself/himself besides the usual classroom responsibilities. To research and write the kind of creative script that Brentano expected could take 20 or more hours. Another problem was that when a trained tape teacher left a school there was often no one trained to use tapes to replace her/him. The loss of the trained tape teacher often meant that tapes were no longer used or were not used as Brentano intended.

Brentano's intent was to have the Tape Institute create an entire tape curriculum for all elementary subjects, but this never came to pass. From what I can tell from my research, it seems that the Tape Institute never made an entire year's set of tapes for any subject for any grade. Most of the creative, artistic tapes produced by teachers for the Tape Institute were not correlated to specific textbooks. Teachers using tapes obtained from the Tape Institute had to figure out where in their own curriculum to use a tape or set of tapes. For instance, tapes that a teacher created for her/his fifth grade social studies class in Kansas may not fit with a similar class in Kentucky. Tapes also became outdated rapidly and required a teacher to update and re-record a new tape.

Since tape teaching was first implemented in Catholic schools, the press and others raised questions as to whether tape teaching could be as effective in public schools as it was in Catholic schools. An article in *The New York Times* (Fine, 1957, p. 47) asked, "Can this program operate as effectively in a typical public school, with large classes and overworked teachers?" Another problem that kept tape teaching from becoming more widespread in public schools was the Catholic content of many tapes. Most of the participants at the summer tape workshops were members of Catholic religious communities who taught in Catholic schools. As they would when teaching in their own classroom, the scripts they wrote contained numerous references to things Catholic although these were not scripts for religion class tapes. For instance, a script for a tape for first grade science began with, "Today, boys and girls, we are going to talk about this big, wide, wonderful world that God made for us." The Catholic content of tapes was problematic when Brentano sold the tapes.

Brentano had little assistance in running the Tape Institute. It seems that she had someone available to multilith the worksheets and at times had part time secretarial help. From several letters written to Brentano from tape teachers, it seems that she sometimes had a hard time getting the correct tapes, scripts, and worksheets mailed to teachers in a timely manner.

In some ways Brentano may have been counter-productive in carrying on her own tape teaching innovation. For instance, her attitude was that all tapes were always unfinished. This attitude meant that Brentano was always in the process of revising and updating tapes. Brentano was not a practical, detail person, but a dreamer and a visionary. Once she had experimented with tape teaching and saw that it could be successful, Brentano moved on to explore her other creative ideas. As early as 1958, she started working on a Thinking Curriculum that used audio tapes and worksheets to teach thinking skills to children in elementary school. The Thinking Curriculum grew to involve the study of the importance of color in teaching and how to teach logic to elementary

school children.

The End of Tape Teaching

With the increasing availability and popularity of video technologies in education and computer-aided instruction plus Brentano's shift to other interests, tape teaching soon became history. By 1962, there were no longer articles in newspapers or magazines about her tape teaching methods and by the middle 1960s, there was very little correspondence to Brentano regarding tape teaching. In 1970 Brentano entered into a contract with Scott Scientific, Inc. of Fort Collins, Colorado, to sell them the tapes, scripts, worksheets, reel-to-reel tape recorders, and other equipment with the hope that they could successfully market them. Despite the best efforts of Scott Scientific, including removing the references to God and things Catholic, re-voicing the tapes, copying them onto cassettes, and creating ditto masters of the worksheets, by 1971 Scott was no longer able to sell any of her tapes and Brentano's tapes were eventually returned to her (A. Spring, personal communication, April 29, 2000).

Importance of This Research for the Field of Educational Technology

My research provides several interesting results for the field of educational technology. Due to space considerations, I discuss two of these in this paper. Besides making known an overlooked innovation in the field, my research provides a comprehensive look at an innovation in educational technology from its initial idea to its conclusion. I have extensive documents from Brentano including personal correspondence and even some reel-to-reel tapes that she made describing tape teaching and its history. Interviews with the first two tape teachers from St. Scholastica Academy, with several tape teachers involved during the height of tape teaching, and with some who used tapes during its waning years of use provide a fascinating look at the life cycle of an innovation. Personal communication with friends and associates of Brentano during the tape teaching years supply a wealth of knowledge and insights about what it was like for Brentano as an innovator in educational technology during the 1950s and 1960s. My dissertation, *Sister Mary Theresa Brentano, O.S.B.: Innovator in the Use of Magnetic Audio Tapes–An Overlooked Story in the History of Educational Technology* (Herndon, O.S.B., 2002 (anticipated)), provides a more thorough documentation of Brentano's innovation than is possible here.

The second implication of my research concerns why official histories of educational technology have overlooked Brentano's individualized tape teaching innovation. I believe there are several possible reasons for this oversight. Brentano's work was featured in more than thirty newspaper and magazine articles including *The New York Times* (Fine, 1957) and *Newsweek* ("Electronic classrooms," 1957). The United States Information Agency ("USIA television service films electronic classroom," 1959) produced a five-minute movie clip illustrating Brentano's tape teaching innovation. Upon her death, *The New York Times* ("Nun Who Pioneered the Use of Electronic Teaching Dies," 1987) printed her obituary. One might guess that her place in the history of educational technology was assured. However, the popular press is not usually a place where academics look when writing the history of the field. For instance, De Vaney and Butler in "Voices of the Founders: Early Discourses in Educational Technology" (1996) used information from audiovisual textbooks and oral history audiotapes from the Archives of the Department of Audio-Visual Instruction. Brentano did not write a textbook about individualized tape teaching and the reel-to-reel oral tapes that Brentano herself made have been stored in the Mount St. Scholastica Archives unknown to anyone at all until this research.

The data that I have does not suggest that Brentano belonged to any professional organizations. One can only guess that Brentano may have believed that she did not have time or that she had no need for any type of professional affiliation. She did speak at many regional professional meetings and also two national conferences: the Catholic Audio-Visual Association Conference in 1954 and the Department of Audiovisual Instruction Convention in 1962. The only professional publication of her work is the text of her presentation from the latter convention published in *Audiovisual Instruction* (S. M. T. Brentano, O.S.B., 1962). One might guess that women religious were not permitted or encouraged to hold membership in professional organizations or to publish scholarly papers during the 1950s and early 1960s, but that was not so at Mount St. Scholastica. During this time period, several sisters were actively involved in professional organizations and in publishing scholarly research.[5]

Other reasons could also have contributed to Brentano's work being overlooked in official histories of the field of educational technology. Very little is written in any book regarding the use of audio tapes in the classroom, including Saettler's (1990) definitive history of the field, *The Evolution of American Educational Technology*. Brentano's original work with audio tape teaching was not based at a major research university, but at a small Catholic K-12 school. When she did move her base of operation to be associated with a college, it was to Mount St. Scholastica College, a very small Catholic women's college in Atchison, Kansas. Although this does not outwardly appear to be a concern to Brentano, this move was not helpful in making her work known in academic circles. De Vaney and Butler (1996) state that, "Historically, although women in audiovisual education played major roles, they were often overlooked and/or assigned minor ones" (p. 39). One can speculate that the fact that Brentano was a woman and was a member of a Catholic monastery were also reasons in their own way for her being overlooked in official histories of the field.

Conclusion

This paper presented an overview of Sister Mary Theresa Brentano's innovation in educational technology–the use of magnetic audio tapes to provide individualized instruction to children in K-12 schools. I described Our Lady of Wisdom Hall at St. Scholastica Academy, Covington, Louisiana, the first school designed and built for electronic teaching with its two different types of Classroom Electron. Benefits of tape teaching were recounted along with some challenges and problems involved with the innovation. Lastly, I presented two contributions this research contributes to the field of educational technology: a complete history of an innovation in educational technology from its beginning to its end and some reasons how an innovation such as this can be overlooked in the official histories of the field.

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