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ABSTRACT

Traditional electronics engineering technology (EET) graduates have a broad and general background in EET, but they encounter difficulty when faced with the modern computerized working environment. The EET curriculum trains students to be broad-spectrum, general electronic technicians rather than specialized ones. EET graduates are competing in the job market with graduates from industrial technology programs who have an associate degree and training that emphasizes computer electronics technology and related topics. Traditional EET program graduates can be upgraded to a level of competence in networking through specialized computer-integrated technology (CIT) training in an additional summer quarter after receiving a traditional associate degree in EET. These graduates can take elective courses in the EET curriculum that are oriented toward the CIT area. Courses would meet the prerequisites in this area of specialized training. The student who wished to enter the CIT certificate program would take two pre-CIT courses in place of the two standard EET electives and new courses from the CIT curriculum. In addition, part of the material covered in the CIT area of study would overlap with existing EET courses. (Four figures are appended.) (YLB)

COMPUTER INTEGRATED TECHNOLOGY AND ITS INFLUENCE ON ENGINEERING TECHNOLOGY PROGRAMS

Leei Mao

ABSTRACT

Our traditional EET graduate has a broad and general background in electronics engineering technology. However, when they encounter the more recently produced small, powerful computerized electronic equipment in industry their talents are becoming less and less useful. Our graduates are competing in the job market with graduates from our Industrial Division who not only have the Associate Degree but their training emphasizes computer electronics technology and other related topics.

How can we develop a brand new curriculum in the EET program to meet the challenges of our computer age? Will two years be enough for the EET Associate Degree program? How will these computer related programs affect other Engineering Technology programs? Do we need a separate electronics division; one separate from Engineering Technology Division and Industrial Technology Division to cover electronics and computer related programs? Are there any alternatives to what we are doing, and what we need to do? These questions are crucial.

INTRODUCTION

Community colleges and technical colleges already use local area networks as a tool to connect numbers of personal computer together. A local Area network is a communications network that provides interconnection of a variety of data communication devices within a small area. By using local area networks, we can interconnect personal computers together

To share and exchange data between PCs and
To share expensive resources.

In the past, local area networks operated independently. Each network run their own utility programs one a time. Recently, mini-computer has been used as a server to connect more networks together to extend data communication into college wide range instead of within a small lab.

Althought the network is so necessary for academic programs in the college to function adequately, their role is often still misunderstood and their influence on academic porograms has been ignored and seldom been studied.

In the training institution, local area network will support and/or need support from varieties academic programs. For example:

* Electronics Engineering Technology program serves as a back bone to give necessary training to freshman such as they may have enough electrinc background before emphasize their speciality in computer related technology programs.

* Computer Integrated Technology program provides network system planning, data detecting, programming and overall network system management.

* Telecommunication Technology program studies how data transfer from work station to work station, network to network, and how to provide a communication channel between two system which do not have compatable system format.

* Graduates from other engineeing programs; such as engineering graphic technology, machine tool technology, mechanical engineering technology, construction engineering technology and archtecure engineering technolgoy; are end user of this network system. They need training in Computer Aid Desgn, Computer Aid Manufacturing, etc.

STATEMENT OF THE PROBLEMS

Traditional EET graduates have a broad and general background in electronics engineering technology. However, when they encounter the modern computerized working environment, for instance ones that involve data communications equipment, digital network equipment, or automated manufacturing, their talents may become taxed. EET curriculum only trained these students to be broad spectrum, general electronic technicians rather than training them to service only specific kind of equipment. Historically, graduates from the Industrial Technology programs not only achieve an Associate's Degree in Industrial Technology but they are also trained to be highly specialized in only one job related area. Examples would be the Computer Electronics Technology or Telecommunications Technology programs.

It has been difficult to develop brand new extensively specialized training schems and incorporate them into the curriculum of the EET program, while retaining the broad spectrum approach to technical engineering education. There is concern about how current EET graduates will meet the new challenges of the dawning integrated computer age. Many have wondered if the EET program needs to move toward a more highly specialized Associate Degree program in Engineering Technology. Yet many others have voiced opposition to such a change in emphasis in the curriculum. There is some documented concern about the kind of impact that such a new computer related program would have on the other programs in the Engineering Technology Division. There is some question whether such a new program will open

new doors for local people or just further divide existing student resources with the other engineering programs. One starts to ask if two years is enough for the EET Associate Degree program.

It would seen that there is a need for an alternative that helps EET and non-EET students, become better prepared to work in computer related manufacturing environments without compromising their flexibility. The way that these concerns are addressed in the near future is crucial.

METHODS OF APPROACH

Traditional EET program graduates can be upgraded to a level of comptence in networking through specialized Computer Integrated Technology training in an additional Summer Quarter after receiving a traditional Associate's Degree in Electronics Engineering Technology. This objective will accomplished by taking elective courses in the EET curriculum that are oriented toward the Computer Integrated area. These electives will be offered to all EET students and can be used as a tool to meet the prerequisites in this area of specialized training. EET students wishing to pursue this extensive training in Computer Integrated Technology will work with he EET Department to build up their electronic background before taking computer integrated courses. Other graduates who intend to pursue BET degrees at four-year colleges can chose options that allow them to still be juniors in the Fall semester. Figure 1 and 2 show the training path flow used by EET students at Greenvill Technical College which is designed under this concept where Process Control/Instrumentation Technonogy and Biomedical Engineering Technology programs were installed in 1989.

The CIT curriculum will not stand alone. It will be the culmination o a prearranged process that uses many of the existing resources of the EET department. The student wishing to enter the CIT certificate program will be required to first achieve an AS EET degree. While pursuing the EET degree the student will take two pre-CIT courses in place of the two standard EET electives.

The CIT curriculum will contribute totally new courses that standard EET students can chose for their electives. In addition to these totally new courses, part of the material convered in the CIT area of study will be incorporated or "bleed over" into existing EET courses. It can be seen that this "bleed over" will expand the scope of existing EET courses such as those dealing with microporcessor hardware, or telecommunications.

The CIT component will rely heavily on the classroom and lab facilities of the existing EET department. In turn the EET department will benefit because equipment purchased for the CIT component will be maintained in the same area as that of the EET department and will expand the subject areas and kinds of experiments that are offered. This will give the EET graduates exposure to computer networking and digital data communications, in addition to their traditional areas of

study. This intensive training will make them more competitive in tomorrow's job market. Figure 3 and 4 show typical classroom arrangement for CIT program.

CONCLUSION

Implemented advanced certificates program, such as Computer Integrated Technology, in the Engineering Technology Division will help future traditional Electronics Engineering Technology students become better prepared to work in computer interrelated manufacturing environments without compromising their flexibility.

It will also assist past and present EET graduates as well as non-EET students in their electrical technology educational preparations and update efforts.

Implementation of this curriculum will produce trained graduates who will assist local industry in its efforts to stay competitive in the global marketplace, and help manufacturers keep abreast of new technology.

This curriculum will give the current EET students new exposure to computer networking and digital data communications, in addition to their traditional areas of study.

Totally new CIT courses will be generated as EET electives. In addition material generated by the CIT curriculum will bleed over and expand and scope of existing EET courses.

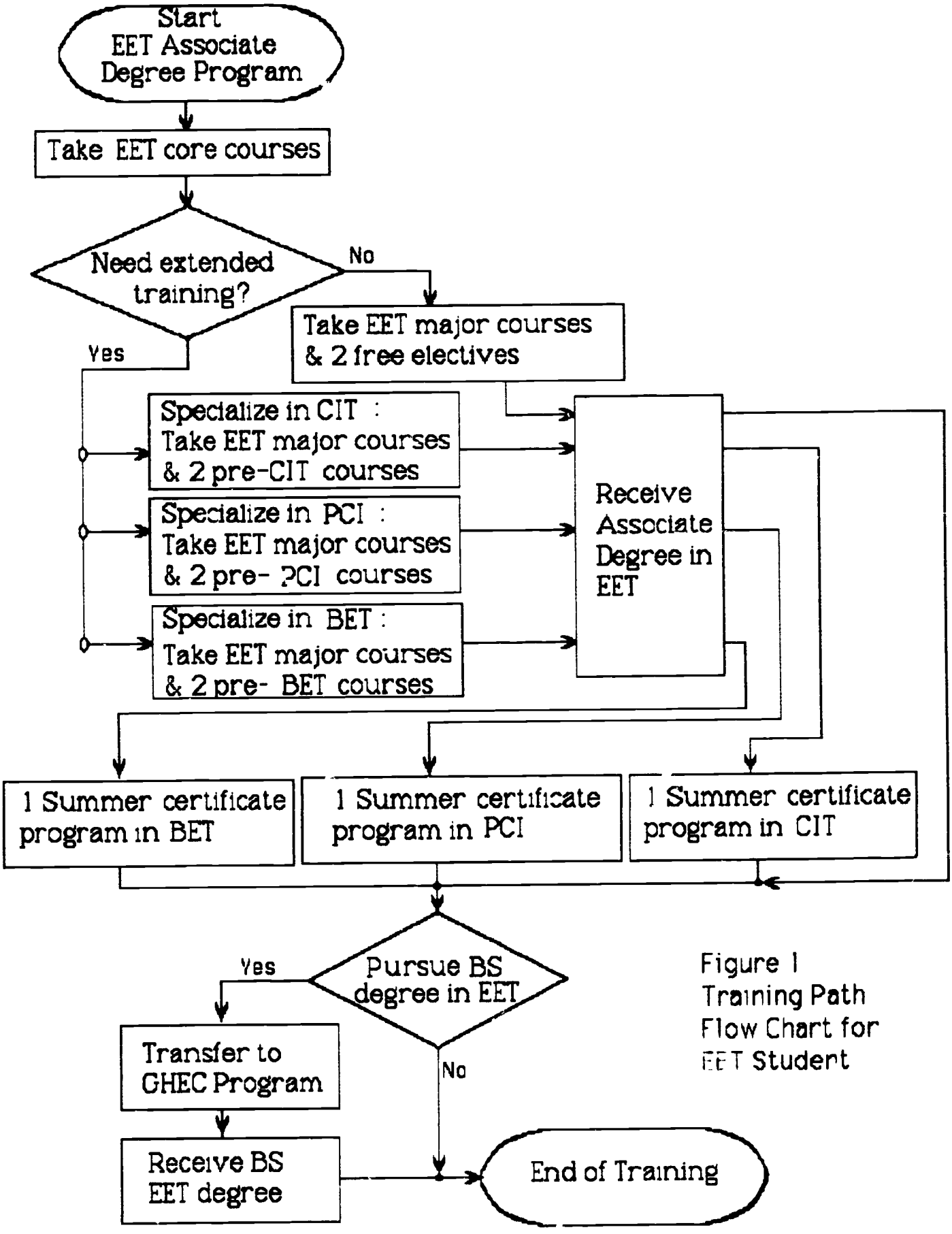

Figure 1
Training Path
Flow Chart for
EET Student

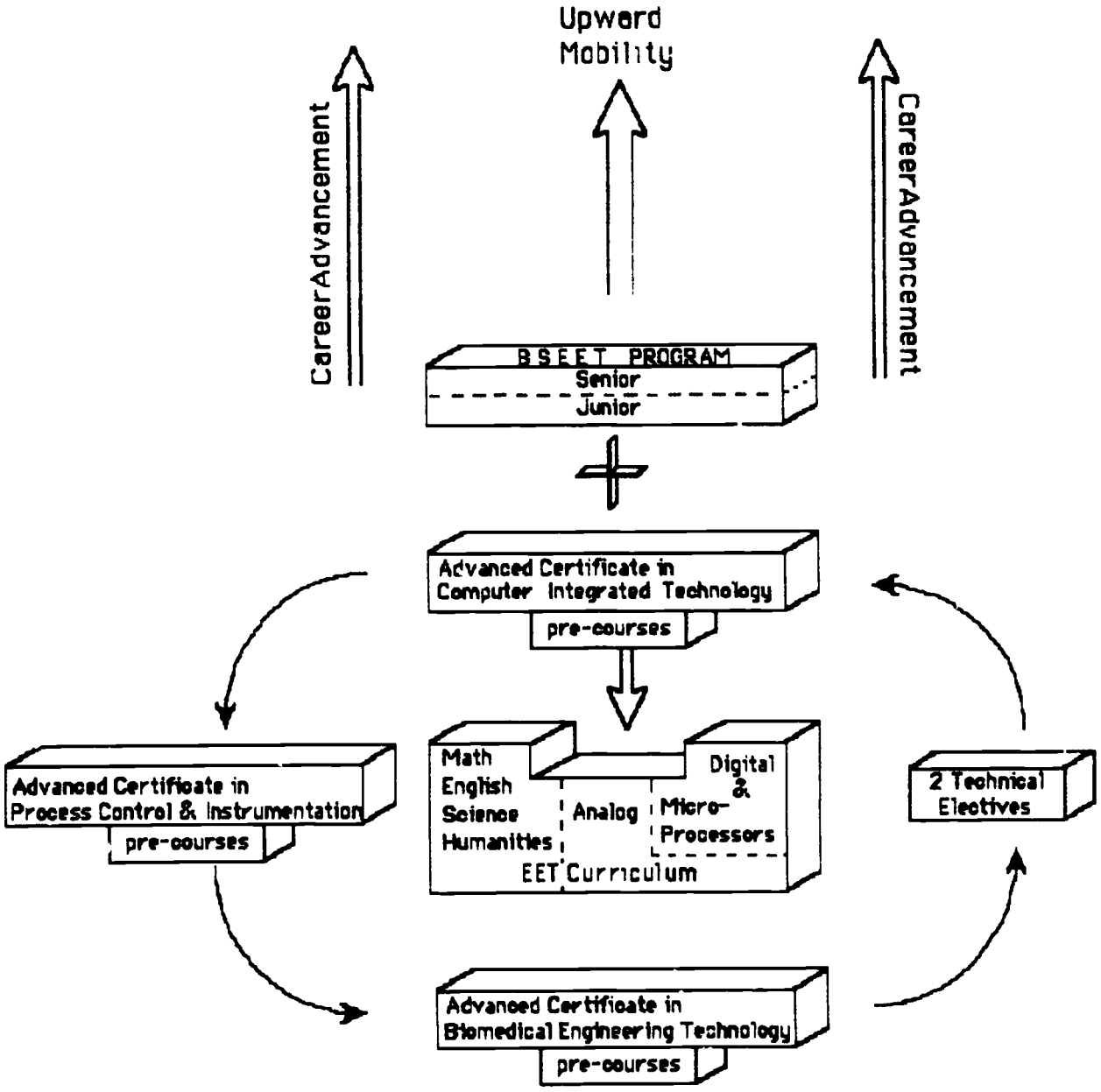

Figure 2

Layered Curriculum Architecture

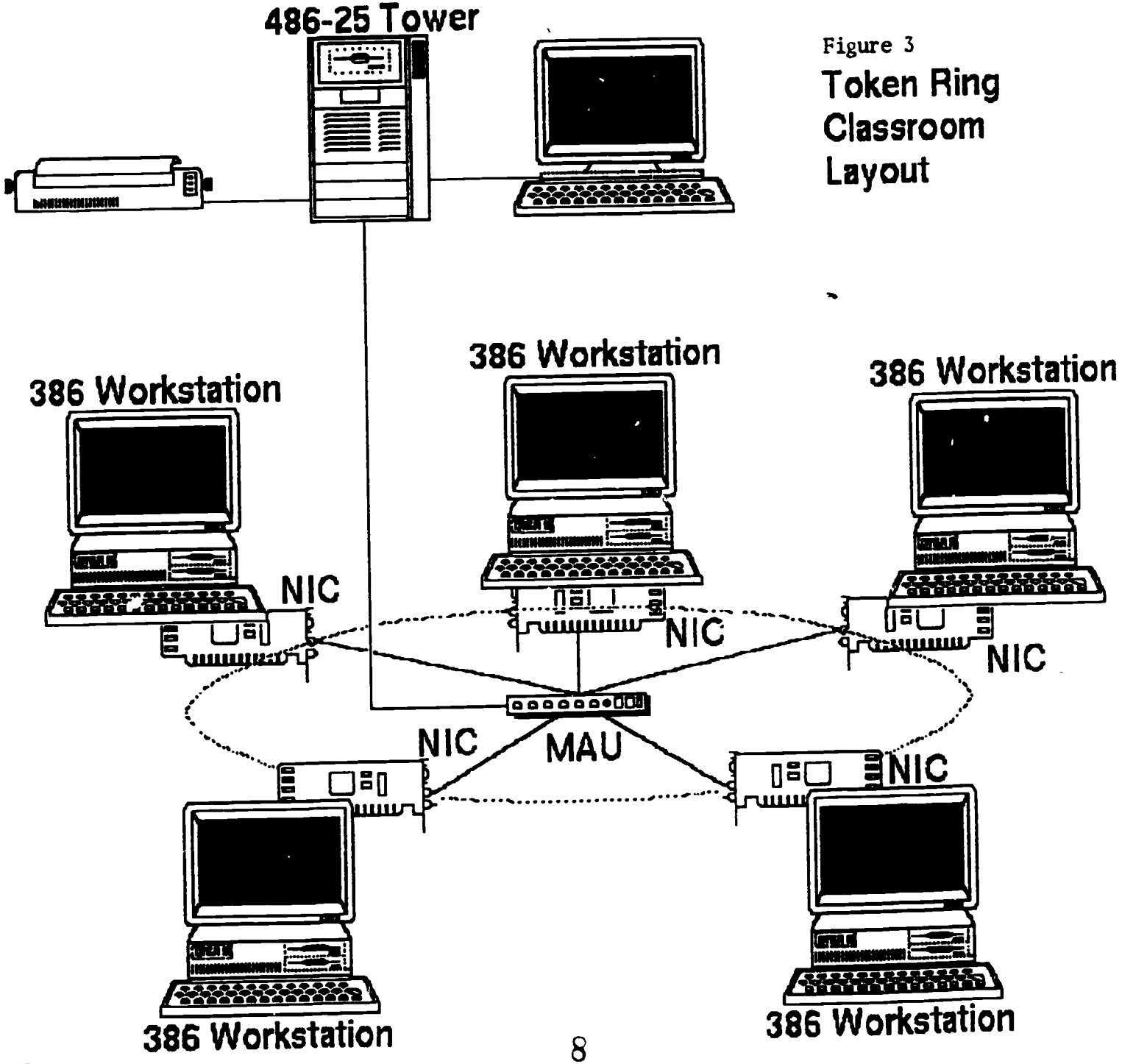

Figure 3
Token Ring
Classroom
Layout

Figure 4

Ethernet Classroom Layout