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BASIC DESIGN STUDY REPORT ON THE PROJECT FOR STRENGTHENING OF EQUIPMENT AT THE INSTITUTE OF EDUCATIONAL TECHNOLOGY OF ALLAMA IQBAL OPEN UNIVERSITY IN THE ISLAMIC REPUBLIC OF PAKISTAN

MARCH 1995

UNICO INTERNATIONAL CORP

JAPAN INTERNATIONAL COOPERATION AGENCY

MINISTRY OF EDUCATION,
THE ISLAMIC REPUBLIC OF PAKISTAN

No. 1

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PREFACE

In response to a request from the Government of the Islamic Republic of Pakistan, the Government of Japan decided to conduct a basic design study on the Project for Strengthening of Equipment at the Institute of Educational Technology of Allama Iqbal Open University and entrusted the study to the Japan International Cooperation Agency(JICA).

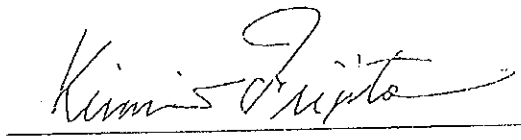
JICA sent to Pakistan a study team headed by Mr. Senichi Kimura, Deputy Director, Second Basic Design Study Division, Grant Aid Study and Design Department of JICA and constituted by members of UNICO International Corporation, from December 11 to December 31, 1994.

The team held discussions with the officials concerned of the Government of Pakistan, and conducted a field study at the study area. After the team returned to Japan, further studies were made and, as this result, the present report was prepared.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Islamic Republic of Pakistan for their close cooperation extended to the team.

March 1995



Kimio Fujita
President
Japan International Cooperation Agency

March 1995

Mr. Kimio Fujita
President
Japan International Cooperation Agency
Tokyo, Japan

Letter of Transmittal

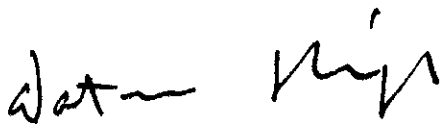
We are pleased to submit to you the basic design study report on the Project for Strengthening of Equipment at the Institute of Educational Technology of Allama Iqbal Open University in the Islamic Republic of Pakistan.

This study was conducted by UNICO International Corporation, during the period from December 8, 1994 to March 28, 1995. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Pakistan and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

We wish to take this opportunity to express our sincere gratitude to the officials concerned of JICA , the Ministry of Foreign Affairs and the Ministry of Education, Science and Culture. We would also like to express our gratitude to the officials concerned of the Institute of Educational Technology, Allama Iqbal Open University, the Ministry of Education , JICA Pakistan Office and the Embassy of Japan in Islamabad for their cooperation and assistance throughout our field survey.

Finally, we hope that this report will contribute to further promotion of the project.

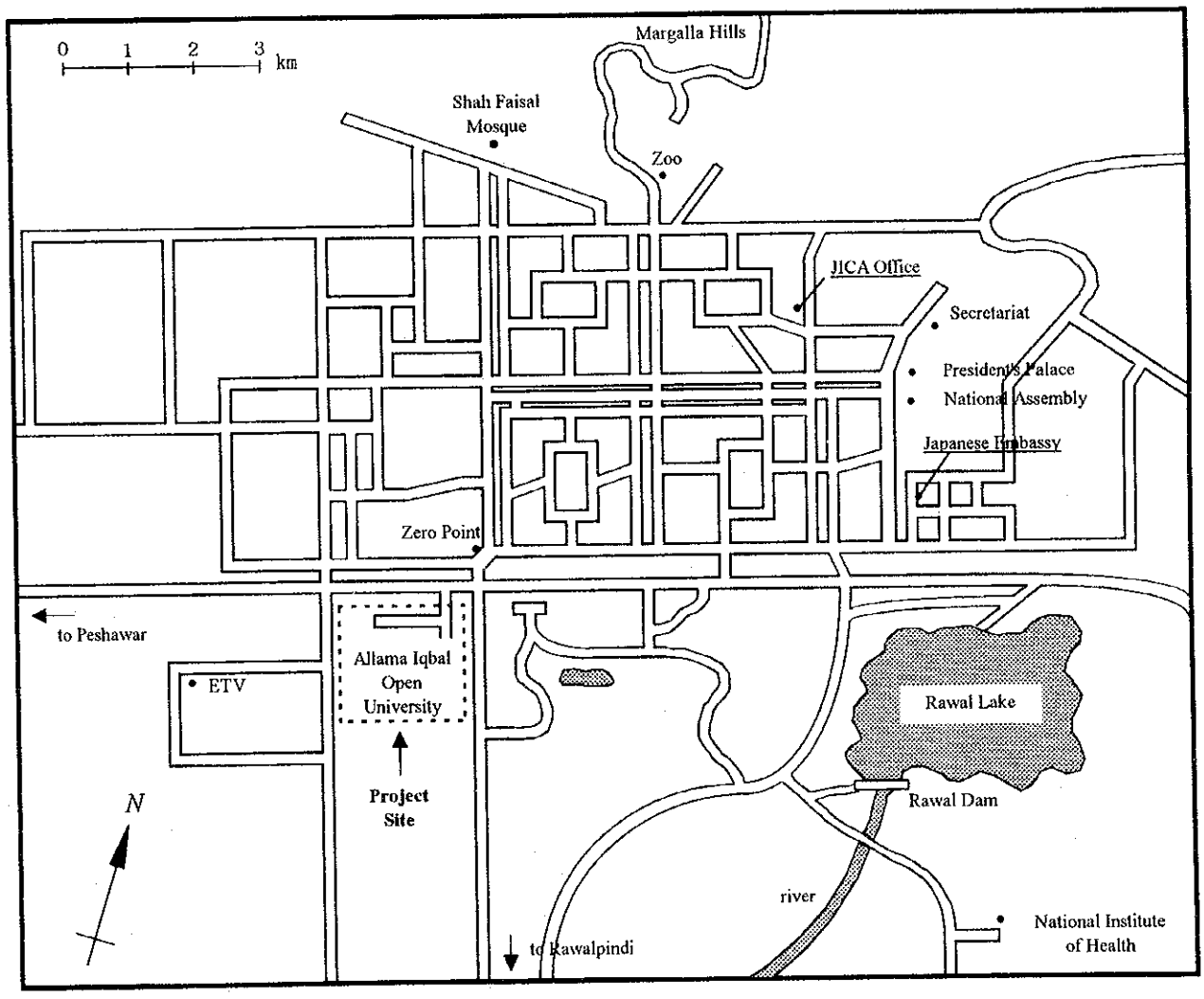
Very truly yours,



Wataru Shiga, Project manager,
Basic design study team on the Project
for Strengthening of Equipment at
the Institute of Educational Technology of
Allama Iqbal Open University,
UNICO International Corporation

THE ISLAMIC REPUBLIC OF PAKISTAN

CITY OF ISLAMABAD



SUMMARY

SUMMARY

The real economic growth rate of the Islamic Republic of Pakistan in the 1980s was on a high level of an average of around 6% in terms of GDP, and the country has been achieving growth of over 5% on the average in the 1990s. However, despite such economic growth, there have occurred a tendency for prices to rise due to inflation, structural financial deficits due to weak tax collection system and stiffening of ordinary expenditure, and deficits in the balance of international payments due to limitation of the kinds of exportable goods and decrease of remittance by overseas workers. These have become factors to pressure the country's economy.

To break through such a situation, the Government of Pakistan has formulated a series of development plans mainly aiming at inviting private sector to participate in every sphere of the economy, promotion of exports, improvement of the balance of international payments and reduction of financial deficits. In particular, creation of new employment opportunities and reduction of regional economic imbalances have comprised priority issues. In this respect, particularly great expectations are being placed on economic development mainly through development of the industrial sector dispersed in the various areas in the country and of the agricultural sector through application of science and technology. To shoulder such development of the Pakistan's economy of a national scale requires massive and continuous training of manpower who have received at least basic education, and thus promotion of development of human resources by placing emphasis on education and training to promote manpower development has become an urgent issue.

The estimated literacy rate in Pakistan in 1993–94 is 36.8% which is very low compared with the world average adult literacy rate of 75% and the average of 66% for developing countries and regions in 1990. In particular, the literacy rate for women is as low as 23.5%, and that for rural residents (27.5%) is also very low compared to that of urban residents (57.0%). Also, the national average participation rate in primary level was estimated as 70.8% (boys: 86.3%, girls: 54.9%) in 1993–94 which was one of the lowest in the south–western Asian region. This is due to composite factors such as qualitative and quantitative shortage of teachers (particularly of female), shortage and inadequacy of school facilities and shortage of education budget, and it is considered difficult to promote an immediate improvement. For these reasons, in addition to developing human resources as comprising the developmental infrastructure in the area of economic development, enrichment of education for all of the people to ensure basic human rights, or basic education, has become a pending issue in Pakistan.

As a part of the educational policies to break through such a situation, the Allama Iqbal Open University (AIOU) was established in 1974 as Asia's first institution of distance education. This University has been providing educational opportunities to people who are willing to study but cannot receive formal education for economic and physical reasons particularly women and residents of rural areas. It is also carrying out such things as to improve the abilities of teachers who have not received formal teacher education and provision of higher education to adults. At present, the teaching aids used in the distance education provided by the AIOU use three mass media namely print, sound and picture. The teaching aids are all being produced at the AIOU's Institute of Educational Technology (IET) which has so far produced 332 video programmes (30-minute TV programmes), 2,034 audio programmes (15-minute radio programmes) for broadcasting and 251 video tapes, audio tapes and slide flips for individual and group study. The equipment now being used in producing the teaching aids consists of pilot scale TV studio equipment provided by the assistance of United Nations Development Program (UNDP) and radio studio equipment provided through British Overseas Development Administration (ODA).

The audio-visual equipment however has outlived its utility since its initial installation and has become outdated and superannuated, and both quantitatively and qualitatively, it has become difficult to prepare the teaching aids required by the AIOU. Among the various audio-visual aids produced by the IET, the video programmes are being broadcast through Pakistan Television Channel 2 (ETV) for which the Japanese Government has provided grant aid assistance for procurement of broadcasting equipment. However, due to such reasons as that a part of the IET's TV studio equipment which is required to have technical compatibility with ETV's renewed broadcasting equipment has virtually become obsolete, there have emerged impediments in the capacity to produce educational programmes.

On the other hand, the people's needs for distance education have been increasing every year. As a consequence, the AIOU planned to redouble the production of audio-visual aids and has come to foresee impediments in production capacity of the IET. For this reason, the AIOU authorities formulated a plan to expand the IET by renewing its existing equipment and introducing new equipment for producing audio-visual aids, and requested the Government of Japan for grant aid assistance.

Upon this request the Japanese Government decided to conduct a basic design study on this proposal. Accordingly, the Japan International Cooperation Agency (JICA) dispatched

a basic design study team to Pakistan from December 11 to 31, 1994 for a field survey. The study team had a series of discussions with the authorities of the Government of Pakistan and the Allama Iqbal Open University on the scope of the project, details of the request, arrangement of the project implementation, maintenance and management plans, works to be undertaken by the Pakistan side, etc. The study team visited AIOU, IET, a regional office in Peshawar, and ETV and collected information and data related to the project.

The outlines of the study are mentioned below.

(1) The equipment presently used at the IET is the one provided through the UNDP and British ODA in 1979, and the format of the videocassette recorders (VCRs) used in such purposes as editing video images is of the U-Matic low-band type. The video grade of the U-Matic low-band equipment is four to five generations older than that of the present video technology. When limited to production of video programmes of the level of broadcasting, there are no cases in which it is still being used in Japan or any other country. Also, the 3/4″ tape used under this format is expensive compared to the 1/2″ tape now mainly used which has been increasing the equipment's running cost. It has hence become an equipment with poor economic efficiency. These items of equipment have been in use for over 15 years since they were introduced. Although they have become markedly superannuated, they are being maintained in a good state, and most of them are still fully operating today.

(2) The IET comprises an independent production studio specialising in the production of educational programmes. Although there are fluctuations over the years, it is producing around 50 video and 100 audio educational programmes a year using its existing equipment. The programmes are being broadcast one hour (2 programmes) every day through ETV in the case of video aids and 15 to 45 minutes (1 to 3 programmes) a day through the Pakistan Broadcasting Corporation (PBC) in the case of audio aids. In order to cope with the increasing social needs for distance education however, the AIOU and IET are planning to produce around 100 video and 400 audio programmes a year by using both the existing and new equipment. When consideration is given to provision of programmes to the ETV which is expected to drastically increase in the future, it will be necessary to develop both the quality and quantity of the teaching aids produced by updating these pieces of equipment to those which are compatible with the system that has now become the main current in the world.

(3) At present, the IET has the production staff of 14 of the production section headed by the senior producer, 16 staff of the engineering section headed by the chief engineer and 18 staff of the design section headed by the chief designer. It is producing programmes using the current facilities of one TV studio, two editing systems, one recording studio and one outdoor coverage car. In particular, in the case of production of video programmes whose operation becomes busy, the IET has the capacity to produce a maximum of six programmes a month by adjusting the schedule in such a way as to avoid overlaps in the works related with the various projects. In addition to a main TV studio facility, the request includes a field production car to enable shooting on location and materials gathering and on-the-spot editing so that the IET will virtually have two studio systems. To cope efficiently with the increasing amount of editing works of the video tapes shot outdoors or in the studios, three systems of editing equipment is planned to be added. Moreover, it is planning to move the existing TV studio equipment to the present storeroom of stage settings and properties and make it into a sub-studio exclusively for the use in training IET personnel and producing non-broadcast programmes. As a result of the foregoing, the IET will have two TV studios (one main and one sub), five editing systems, one recording studio, two outdoor news-gathering vehicles (including the current one) and one field production vehicle. In terms of facilities, this will achieve the scale sufficient in producing the planned number of teaching aids.

(4) The IET's equipment are to be maintained and controlled by the engineering section under the guidance of the chief engineer. In the case of the existing equipment, the senior engineer, TV engineers and associate engineers are controlling the equipment under their charge on a daily basis. The spare parts however are all stored in the technical store inside the IET building and the store keeper in charge is controlling the inventory. Also, for the actual repairs and maintenance, there is a separate engineering and maintenance room inside the building. The equipment to be introduced through this project will also be maintained through this maintenance and control system. As can also be seen from the fact that the IET is continuing to use old items of equipment by maintaining them in good order, the IET engineers' maintenance and management ability is basically very high.

(5) In preparing for the increase in the operation volume when this project is executed through grant aid, the IET is planning to include 26 new personnel in 1995-96 AIOU budget (5 of these are to be assigned to the production section, 13 to the engineering section, 2 to the design section and 6 to the main office). The IET personnel as a whole including these additions will be 91. If the personnel increase plan progresses as planned and the equipment are introduced through this project, the IET will have a capacity to

produce around 100 video and 400 audio programmes a year.

Among the educational programmes to be produced by the equipment provided through this project, the video programmes will be broadcast by ETV. ETV however has already developed mainly broadcasting equipment through Japanese grant aid. Therefore, the contents of the present project have been conceived based on the following assumptions.

- To avoid duplication with the contents of the cooperation provided to ETV, equipment whose main objective is to transmit broadcasting signals will not be covered by the project;

- Equipment which requires enlargement of the IET's existing building or new construction will not be covered by the project;

- Equipment whose installation requires substantial improvement works will not be covered by the project.

Based on the study result and considerations mentioned above, a basic plan for strengthening of equipment at the Institute of Educational Technology of Allama Iqbal Open University is prepared. The outline of the plan is as follows.

1) Executing Agency :

Institute of Educational Technology, Allama Iqbal Open University

2) Plan of Activity :

By using existing equipment and new equipment to be provided under this project jointly or in parallel, the IET will produce around 100 video and 400 audio teaching aids annually for use in distance education by the AIOU. Among these aids, those for broadcasting purposes will be sent to ETV and PBC for regular transmission, while the other non-broadcast materials will be sent to the regional offices and study centres or directly to the students' homes.

3) Outline of the Equipment :

The equipment to be provided by this project was selected based on the conditions that;

- Audio-visual teaching aids produced by the IET's equipment will be transmitted

through the public broadcasting network;

- Technical level of the overall system of the equipment needs to be compatible with that of broadcasting stations in Pakistan;

- Emphasis is placed on the equipment as system component;

- Installation of the equipment will not require substantial modification, enlargement or new construction of the IET building.

The following shows the major items of equipment selected.

A) TV Studio
(Colour Camera Chain, Flyingspot Scanner, Character Generator, Video Production Equipment, Audio Production Equipment, etc.)

B) Central Apparatus Room
(Sync Signal Generator, Television Generator, Automatic Change Over Unit, Video Distribution Amplifier, Audio Distribution Amplifier, Pulse Distribution Amplifier, Video/Pulse Delay Unit, etc.)

C) Editing Equipment
(Automatic Editing Control Unit, VCR with Time Code & TBC, 14-inch Picture Monitor with Audio Speaker, etc.)

D) Post Production Studio
(VCRs, Editor, Video Production Equipment, Audio Production Equipment, etc.)

E) Outdoor Coverage Equipment
(VCR in Camera, Audio Equipment, Monitor Equipment, Portable Lighting Kit, Outdoor Coverage Car, etc.)

F) Measuring Equipment & Tools
(Measuring Equipment, Tools)

G) Installation Materials
(Installation Materials)

H) Power Supply
(Distribution Board, Isolation Transformer, AVR)

I) Presentation Equipment
(Colour Video Projector, 20-inch Colour Picture Monitor, 40-inch Colour Picture Monitor, VHS VCR, etc.)

J) Electronic Field Production Car
(Colour Camera Chain, Video Production Equipment, Audio Production Equipment, etc.)

K) Other Equipment for Educational Use
(Test Run Tape, Microscope with Camera Attachment, PA System, Conference System, Duplication Master, etc.)

L) Radio/Dubbing Studio
(Audio Mixer, Multitrack Tape Recorder, Compact Disc Reproducer, Tape Recorder/Reproducer, Disk Reproducer, Cassette Tape Recorder/Reproducer, etc.)

M) Spare Parts
(Spare Parts)

The costs of the works to be borne by the Pakistan side are estimated to be about 2 million rupees when the project is implemented through a grant aid of the Japanese Government.

The following results are expected to be attained when the project is realised by the grant aid .

1) Impact on Illiterate Population

Illiterate population including juvenile labourers, rural women and other illiterate adults will have a broader access to education in many fields through distance education utilising audio-visual aids which do not employ any letters. Since the literacy education, women's education and teacher education enjoy higher priority

in the national development plans, this project will create nation-wide impacts on the population specially from a viewpoint of enhancing the basic education system of Pakistan.

2) Amelioration of Education by Means of Broadcasts

Audio-visual programmes produced by the IET of AIOU are broadcast through the ETV which received broadcasting equipment under a project implemented by a grant aid of the Japanese Government. Since the ETV is planned to have a population coverage rate of 95%, those people residing in remote and distant areas will have an increased access to education by means of broadcast.

3) Advancement of Distance Education by New Techniques

The equipment currently existing in the IET is outdated and superannuated after it was installed more than 15 years ago. As far as the video technology is concerned, this equipment is considered quite old belonging to the generation of 4 to 5 before that the video equipment currently used in Japan belongs to. If the equipment with new technology is introduced under this project, the IET will be able to produce high grade audio-visual programmes facing with less frequent problems in operation and maintenance, thus making the production activity of the IET cost-effective. The IET/AIOU will be able to exchange audio-visual programmes as source materials with other institutions and foreign open universities, thus attracting better students by quality programmes. In this way, this project will directly benefit approx. 140,000 students currently enrolled in the AIOU.

4) Augmentation of the Production Capacity

The present TV studio equipment of the IET was supplied by UNDP under technical assistance to the AIOU in 1979 as a pilot TV studio. Current production capacity of the IET is therefore limited both quantitatively and qualitatively. It is envisaged that, by providing the IET with equipment of appropriate technology in sufficient number, the production capacity of TV programme will remarkably increase from approx. 50 to 100 per annum, and radio programme from approx. 100 to 400 per annum. Thus the number of courses offered by AIOU will increase further and the nations' access to education will augment accordingly.

As this project is expected to contribute to raising the condition of basic human needs of the nation through the effects mentioned above, it is justified to implement the project by a grant aid of the Government of Japan. It is further confirmed that there is no problem with the organisational structure of IET/AIOU in implementing the project as the number of working staff is planned to be increased sufficiently and the budget for operation and maintenance of the equipment will suffice. However, following points shall be taken into due consideration by the Pakistan side in order to implement the project smoothly and effectively.

Among audio-visual aids to be produced by the IET using projected equipment, video programmes will be broadcast all over the country through ETV and audio programmes through PBC. Since the production equipment to be used for video programmes in the IET is of a new grade by four to five generations from the viewpoint of video technology, ETV's assistance to IET in terms of latest technology on equipment operation, maintenance, management, etc. is indispensable. Also, it is desirable to further increase the transmission hours for broadcasting of educational programmes in the future in conformity with the educational policy. In this point, it will be necessary for the Ministry of Education, which is the supervisory ministry of this project, to assumes the responsibility to co-ordinate closely with ETV and the Ministry of Information and Broadcasting, which is the supervisory ministry of ETV.

Further, when this project is implemented, renewal of the technology of IET personnel is considered indispensable. On the other hand, it is necessary to improve the delivery system of teaching materials at AIOU headquarters, and, in addition, to reinforce the regional service network in a parallel manner and to try to expand the educational opportunities of students. In these points, the self-help endeavour of the Pakistan side is imperative.

1) Technical Training

While the IET technical staff are capable, compared with the old equipment they have used for over 15 years, items of equipment to be provided through this project have introduced new technologies so that updating of the technical capacity of the personnel in charge in the areas of the equipment operation, maintenance and control and programmes production technology is believed indispensable.

On the other hand, the training items related with the studio are very diverse.

From the viewpoint of how to have the Pakistan side effectively utilise the equipment introduced through the grant aid, it is desirable to carry out the following training at manufacturers' facilities.

a) Software (studio operation): 1 person for 3 months
b) Hardware in general (equipment maintenance and control): 1 person for 3 months

2) Reinforcement of Regional Services

From the results of a hearing conducted at a regional campus in the city of Peshawar visited for an on-site survey, it was observed that the regional services in relation with the distance education has not necessarily been achieved to the full extent at the local level. In the case of distance education, reinforcement of the function of campuses, offices and study centres which are placed in each area in the country is considered to be indispensable for its expansion, since it is a form of education where the teaching side approaches to the place of daily life of students as close as possible, which is different from formal education where students to be taught attend a certain school. It is proposed, therefore, that the following plans to reinforce the regional service network are formulated by the Pakistan side in order to make the project more effective.

A) Provision of equipment and programmes in regional study centres

The current situation of educational equipment in regional campuses, regional offices and study centres varies and it cannot be said that sufficient equipment and audio-visual teaching aids have been provided. Necessary equipment and teaching aids are provided to all schoolrooms where students are directly taught by a tutor.

B) Provision of mobile audio-visual schoolrooms

Regional study centres are newly opened or closed depending on the number of students and contents of study courses. From the viewpoint of providing equal educational opportunities to the whole nation, one audio-visual car (vehicle for mobile education mounting monitors, VCRs, audio equipment, etc.) is distributed to each regional campus in each province.

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CHAPTER 1 BACKGROUND OF THE PROJECT

Chapter 1 Background of the Project

1-1 Background of the Project

The real economic growth rate of the Islamic Republic of Pakistan (hereafter referred to as "Pakistan") in the 1980s was on a high level of an average of around 6% in terms of GDP, and the country has been achieving growth of over 5% on the average in the 1990s. However, despite such economic growth, there have occurred a tendency for prices to rise due to inflation – the average consumer price rose by 6.7% in the 1980s and by around 10% in the 1990s – , structural financial deficits due to weak tax collection system and stiffening of ordinary expenditure, and deficits in the balance of international payments due to limitation of the kinds of exportable goods and decrease of remittance by overseas workers. These have become factors to pressure the country's economy.

To break through such a situation, the Government of Pakistan has formulated a series of development plans mainly aiming at inviting private sector to participate in every sphere of the economy, promotion of exports, improvement of the balance of international payments and reduction of financial deficits. In particular, creation of new employment opportunities and reduction of regional economic imbalances have comprised priority issues. In this respect, particularly great expectations are being placed on economic development mainly through development of the industrial sector dispersed in the various areas in the country and of the agricultural sector through application of science and technology. To shoulder such development of the Pakistan's economy of a national scale requires massive and continuous training of manpower who have received at least basic education, and thus promotion of development of human resources by placing emphasis on education and training to promote manpower development has become an urgent issue.

The estimated literacy rate in Pakistan in 1993–94 is 36.8% which is very low compared with the world average adult literacy rate of 75% and the average of 66% for developing countries and regions in 1990. In particular, as can be seen in the table below, the literacy rate for women is as low as 23.5%, and that for rural residents (27.5%) is also very low compared to that of urban residents (57.0%).

Table 1. 1 Dimensions of Literacy (%)

	1981	1994*
Pakisan	26.2	36.8
Urban Area	47.1	57.0
Rural Area	17.3	27.5
Male	35.1	48.9
Female	16.0	23.5

* Estimated

Source : Economic Survey 1993-94

Also, as the next table shows, the national average participation rate in primary level was estimated as 70.8% (boys: 86.3%, girls: 54.9%) in 1993-94 which was one of the lowest in the south-western Asian region. This is due to composite factors such as qualitative and quantitative shortage of teachers (particularly of female), shortage and inadequacy of school facilities and shortage of education budget, and it is considered difficult to promote an immediate improvement. For these reasons, in addition to developing human resources as comprising the developmental infrastructure in the area of economic development, enrichment of education for all of the people to ensure basic human rights, or basic education, has become a pending issue in Pakistan.

Table 1. 2 Participation Rates, 1993-94 (Estimated)

	Primary Stage (I-V)	Middle Stage (VI-VIII)	Secondary/High Stage (IX-X)
Pakistan	70.8	44.7	29.1
Male	86.3	58.0	37.9
Female	54.9	30.5	19.4

Source : Economic Survey 1993-94

As a part of the educational policies to break through such a situation, the Allama Iqbal Open University (hereafter referred to as the "AIOU") was established in 1974 as Asia's first institution of distance education. This University has been providing educational opportunities to people who are willing to study but cannot receive formal education for economic and physical reasons particularly women and residents of rural areas. It is also carrying out such activities as to improve the abilities of teachers who have not received formal teacher education and provision of higher education to adults. At present, the teaching aids used in the distance education provided by the AIOU use three mass media namely print, sound and picture. The teaching aids are all being produced at the AIOU's Institute of Educational Technology (hereafter referred to as "IET") which has so far produced 332 video

programmes (30-minute TV programmes), 2,034 audio programmes (15-minute radio programmes) for broadcasting and 251 video tapes, audio tapes and slide flips for individual and group study. The equipment now being used in producing the teaching aids consists of pilot scale TV studio equipment provided by the assistance of UNDP and radio studio equipment provided through British ODA.

The audio-visual equipment however has outlived its utility since its initial installation and has become outdated and superannuated, and both quantitatively and qualitatively, it has become difficult to prepare the teaching aids required by the AIOU. Among the various audio-visual aids produced by the IET, the video programmes are being broadcast through Pakistan Television Channel 2 (ETV/PTV2, hereafter referred to as "ETV") for which the Japanese Government has provided grant aid assistance for procurement of broadcasting equipment. However, due to such reasons as that a part of the IET's TV studio equipment which is required to have technical compatibility with ETV's renewed broadcasting equipment has virtually become obsolete, there have emerged impediments in the capacity to produce educational programmes.

On the other hand, the people's needs for distance education have been increasing every year. As a consequence, the AIOU planned to redouble the production of audio-visual aids and has come to foresee impediments in production capacity of the IET. For this reason, the AIOU authorities formulated a plan to expand the IET by renewing its existing equipment and introducing new equipment for producing audio-visual aids, and requested the Government of Japan for grant aid assistance.

1-2 Outline and Major Components of the Request

To cope with such issues as the low literacy and participation rates, shortage of educational opportunities for women and residents of rural areas and shortage of teachers which comprise problems in the Pakistan's educational sector, the AIOU has been wrestling with such activities as literacy education for adults, education for women, education for teachers and vocational education for juvenile workers. Therefore, it can be said that the AIOU is playing important roles in the nation-wide educational development plans in achieving such objectives as improvement of the literacy rate, universalization of primary education, expansion of technical and vocational education and increase of certified teachers. As part of the measures to achieve these goals in the education sector, the objectives of this project are to update the IET's existing studio equipment which has become outdated and superannuated, introduce new equipment for producing teaching aids, thereby strengthen the

capacity to produce audio-visual aids and expand the educational activities implemented by the AIOU.

The administrative and controlling agency on the Pakistan side when this project is implemented will be the Ministry of Education, and the executing agency of the project will be the AIOU. The latter will execute the budget related with the works to be implemented by the Pakistan side for this project. However, the IET has been solely producing audio-visual teaching materials at the AIOU and it will be operating, maintaining and managing the equipment to be provided through this project.

Through execution of this project, the AIOU is planning to produce around 100 video and 400 audio programmes annually. At present, the IET is producing around 50 video and 100 audio programmes a year through the production staff of 14 of the production section headed by the senior producer, 16 staff of the engineering section headed by the chief engineer and 18 staff of the design section headed by the chief designer. It is producing these programmes using the current facilities of one TV studio, two editing systems, one recording studio and one outdoor coverage car. In particular, in the case of production of video programmes whose operation becomes busy, the IET has the capacity to produce a maximum of six programmes a month by adjusting the schedule in such a way as to avoid overlaps in the works related with the various projects. In addition to a main TV studio facility, the request includes a field production car to enable shooting on location and materials gathering and on-the-spot editing so that the IET will virtually have two studio systems. Moreover, it is planning to move the existing TV studio equipment to the present storeroom of stage settings and properties and make it into a sub-studio exclusively for the use in training engineers and producing non-broadcast programmes.

Based on the foregoing, the content of the project requested by the Pakistan side is to develop the following equipment at the IET which is the AIOU's organisation in charge of producing audio-visual teaching aids so that the AIOU can fully cope with the increasing social needs for distance education.

Table 1. 3 List of Requested Equipment

Code	Facility	Purpose	Equipment
A	TV Studio	Replacement	Colour Camera Chain
			Flyingspot Scanner
			Character Generator
			Video Production Equipment
			Audio Production Equipment
			VCR
			Monitoring Equipment
			Studio Intercom Equipment
			Lighting Equipment
B	Central Apparatus Room	Replacement	Sync Signal Generator
			Television Generator
			Automatic Change Over Unit
			Video Distribution Amplifier
			Audio Distribution Amplifier
			Pulse Distribution Amplifier
			Video/Pulse Delay Unit
			Rack Assembly
			Master Clock and Slave Clock
			Telecine Chain
			Signal Distribution System
			Room to Room Communication
			System Converter
			VHF Communication System
			Satellite Broadcast Receiver Set
			Video Colour Printer
C	Editing Equipment	Replacement	Automatic Editing Control Unit
			VCR with Time Code & TBC
			14-inch Picture Monitor w/Audio Speaker
			Console
			Head Set

Code	Facility	Purpose	Equipment
D	Post Production Studio	New Acquisition	VCRs
			Editor
			Video Production Equipment
			Audio Production Equipment
			Monitor Equipment
			Rack Assembly
E	Outdoor Coverage Equipment	Replacement	VCR in Camera
			Audio Equipment
			Monitor Equipment
			Portable Lighting Kit
			Outdoor Coverage Car
			Portable Dimmer
F	Measuring Equip't & Tools	New Acquisition	Measuring Equipment
			Tools
G	Installation Materials	Replacement	Installation Materials
H	Power Supply	Replacement	Distribution Board
			Isolation Transformer
			AVR
I	Presentation Equipment	New Acquisition	Colour Video Projector
			20-inch Colour Picture Monitor
			40-inch Colour Picture Monitor
			VHS VCR
			Overhead Projector
			Electronic Print Board
J	Electronic Field Production Car	New Acquisition	Colour Camera Chain
			Video Production Equipment
			Audio Production Equipment
			VCR
			Monitoring Equipment
			Modified Vehicle
K	Other Equipment for Educational Use	New Acquisition	Test Run Tape
			Microscope w/Camera Attachment
			PA System
			Conference System
			Duplication Master
			Microcamera
			Script Processing Equipment

Code	Facility	Purpose	Equipment
L	Radio/Dubbing Studio	New Acquisition	Audio Mixer
			Multitrack Tape Recorder
			Compact Disc Reproducer
			Tape Recorder/Reproducer
			Disk Reproducer
			Cassette Tape Recorder/Reproducer
			Sync Lock System
			Effecter
			Monitor Speaker w/Amplifier
			Studio Monitor Speaker w/Amp.
			Microphone & Stand
			Announcer Cough Box
			Announcer Desk
			Headphone Box
			Headphone
			1/2" VCR
			Colour Picture Monitor
			High Speed Cassette Duplicator
M	Spare Parts	New Acquisition	Spare Parts

1-3 Project of Other Donors

1-3-1 Project for AIOU by Other Donors

The table below shows the record of the assistance provided to the AIOU by other donor countries and agencies. Among these, the British ODA has been assisting AIOU in four phases a part of which was directly related with the IET. The fourth phase of assistance has already ended, and at present there are no other assistance projects directly covering the IET other than the present project. However, through requests from the AIOU's other teaching departments, the IET occasionally produces audio-visual programmes related to other assistance projects.

Table 1. 4 List of Major Project under Foreign Aid

Project	Aid Agency	Period	Contents
Establishment of AIOU	ODA, UK	1977-91	Overall technical cooperation to establish AIOU
S.S.C. Womens' Matrics	Netherland	1989-94	To provide matric level education to rural females
Strengthening of AIOU (Phase IV)	ODA, UK	1991-94	Consolidation/improvement of AIOU courses/ programmes and facilities.
New PTOC Project	NORAD	1991-96	To reorient the in-service primary teachers
Training of In-service Arabic Teachers	ALESCO	1989-93	To promote language through training of Arabic Teachers (Middle and Secondary)
IFLP	ODA, UK	1991-94	To provide means for rural females to acquire basic literacy and numeracy
Women Middle Level Education	Netherland	1991-94	To provide education to literate women in rural and semi-urban areas upto middle level
Development of Media Material and Teaching Methodologies	Netherland		To promote the literacy material and training for rural females
Regional Institute of Complementary Education	OIC		Educational training and research for Arabic language and culture in the region
Training of PTC Teachers	USAID	1990-99	To train 1,500 primary teachers annualy in NWFP
Promotion of Islamic Studies	UAE	1989-	To train the ulamas/lecturers in teaching of Islamic studies
Islamabad Literacy Project	UNESCO	1992/93	To provide rural females with basic education for creating social awareness
Pre-tested Reading Material for Neo-literates	UNESCO	1991/92	To develop post-literacy material, and to develop reading habits of new literate rural women
Integrated Drugs Demand Reduction	UNDP	1992/93	To make the teachers aware of the abuse of drugs and make them aware of the preventions

Source : AIOU

1-3-2 Cooperation extended by Japan to Pakistan

The following projects have been implemented under the grant aid assistance by Japan in the past in the relevant field of the present project.

1989: Project for Establishment of the Educational Television Channel (Phase I)
1990: Project for Establishment of the Educational Television Channel (Phase II)
1994: Project for Expansion of the Educational Television Channel
1994: Project for Improvement of the Primary Education in the North-west Frontier Province, Project for Construction of Women Teachers Training School and Improvement of the Educational Equipment in the North-west Frontier Province

CHAPTER 2 OUTLINE OF THE PROJECT

Chapter 2 Outline of the Project

2-1 Objectives of the Project

2-1-1 Objectives

In the recent years, it has become widely recognised that to provide to all the people with the opportunities for basic education in ensuring basic human rights and develop the level of education is a major role to be played by the education sector in the area of social development. The education sector also plays a very great role in developing the human resources to shoulder economic development. However, when looked at from such a viewpoint, Pakistan's education sector is not functioning to the full extent in reality.

The problems faced by the country's education sector such as the low literacy rate, the low participation rate in primary schools and the high dropout rate are believed to be greatly due to the social background particularly in rural areas where people regards children as labour force to support the household economy and women as domestic labour force. On the other hand, it is also evident that systematic problems such as shortage of teachers both in quality and quantity, shortage and maldistribution of school facilities, inappropriateness of the curricula and shortage of the education budget have become impediments to the people's willingness to receive education.

To cope with such problems, distance education can play important roles as a method to widely supply educational opportunities by reaching the work places of juvenile workers, of illiterate adults, homes of women in rural areas and the schools of uncertified teachers. In particular, by implementing vocational education through video and audio media using native languages or local dialects for illiterate people and thereby promoting the development of production technologies and developing the awareness for industrial safety and hygiene, distance education can also contribute toward social safety in addition to expanding the economic power. By providing farmers with new agricultural technologies, mechanised agriculture, crop diversification, distribution knowledge, etc., it can contribute not only toward development of the farmers' living standards but also toward expansion of the economic effect on the entire GNP. The functional literacy education can expand the opportunities for the people to participate in the social activities and can be expected to develop the living standards in general. Also, provision of teacher education to uncertified teachers can improve the teaching method and contribute toward raising of the participation rate and lowering of the dropout rate. Moreover, by producing more certified female teachers,

it can be expected to expand the educational opportunities for women. In meeting with such people's needs, the AIOU will be able to establish new educational courses.

Given such conditions, in view of the roles played by distance education as part of the measures to achieve the goals of the education sector, the Government of Pakistan is planning to expand the production capacity of the IET which is in charge of producing AIOU's audio-visual aids. Accordingly, the objective of this project is to renew and update the existing equipment of the IET.

The detailed information on the education sector of Pakistan as well as on the distance education and, more particularly, on AIOU and IET is shown in the following paragraphs.

2-1-2 Programmes to Develop the Education Sector

(1) National and Educational Development Plans

The present national development plan of Pakistan includes the long-term Perspective Plan (1993-2008) and the Eighth Five Year Plan (1993-1998). In the education sector, "National Education Policy 1992-2002" was prescribed by the Ministry of Education in December 1992 as the long-term national education policy.

Among the above plans and policy, the Five Year Plan which occupies an important position as a comprehensive medium-term national development plan started with the First Five Year Plan in fiscal 1955-56 eight years after Pakistan achieved independence in 1947. The present Eighth Five Year Plan's general target is to develop the people's social and economic welfare through promotion of economic growth and control of population increase as an Islamic welfare state. For this purpose, its primary objective is to achieve balanced economic growth by taking account of women's participation in development, rural areas development and regional development by making priority issues such things as alleviation of poverty, equitable distribution of income, achievement of self reliance of the national economy, creation of employment opportunities and consideration for the environment. The Eighth Plan's main issues in the education and training sector are as follows.

- Universalising access to primary education for all boys and girls aged from 5 to 9;

- Enactment and enforcement of legislation for compulsory primary schooling for all children of the relevant age group, wherever the primary school facilities become available at a reachable distance;

- Quantitative expansion and qualitative improvement of technical and vocational education to equip the youth with demand-oriented skills;

- Removing gender, and rural urban imbalances;

- Reforming the management and financing of the universities, de-politicising their campuses, and eliminating duality of their administrative control by the Provincial Governments and financial control by the Federal Government;

- Qualitative improvements of physical infrastructures, curricula (by making the courses demand-oriented), textbooks, teacher training programmes, and examination system at all levels of education;

- Broadening of the resource base for financing of education through increased allocations and encouraging private sector's participation in provision of educational facilities at all levels.

Specific development targets and essentials of the above-mentioned development plans and policy in relation with the education sector are summarised as follows.

1) Targets of the Perspective Plan (by 2008)

- Achieving universal primary education;
- Raising the literacy rate (to 87%);
- Creating additional jobs (for 20 million persons);

- Increasing the rate of those employed in the industrial sector (to 22%);
- Reducing the population growth rate (to 2.3%).

2) Targets of the Eighth Five Year Plan (by 1998)

- Attain universal primary education enrolment in the first year class, both for boys and girls;

- Increase the literacy rate (to 48%);
- Creation of new jobs (for 6.2 million persons);
- Reduce the population growth rate (to 2.7%).

3) Summarised essentials of the National Education Policy

- Achieving the 100% literacy in selected district;
- Involving higher educational institutions in crash training programmes for science teachers;
- Introducing computer education at all levels of education and in all educational management and teachers training programmes;
- Introducing science kits for creative laboratory experiments;
- Introducing education cadre for teachers at par with other services;
- Institutionalising manpower planning for educational development;
- Opening colleges of distance education in the provinces;
- Promoting education of females through a combination of non-formal and distance education;
- Setting up an Institute of Educational Technology (IET) for preparing and producing educational materials for dissemination through second TV channel.

On the other hand, in terms of the human resource development, Pakistan ranks at 132nd in the world (Human Development Report, UNDP, 1993). The major reasons for low performance in human resource development include financial constraints and overcrowding population. To solve these problems, the country has formulated a Social Action Programme (SAP) through support by the World Bank, Asian Development Bank and UN Development Programme and this has been executed since 1992-93. Covered in the education sector are the sub-sectors such as primary education, teacher education, adult literacy education and education foundations. The programme has sought for educational reform through both of the areas of software and hardware such as systemic organisational reform and expansion of facilities by promoting participation by residents. Pakistan's National Education Policy has formulated the targets as shown in the table below by also taking account of the above SAP.

Table 2. 1 Policy Targets in Education Sector

	1992	2002		1992	2002
【PRIMARY EDUATION】			【DEGREE COLLEGES】		
Schools	124,000	230,957	Schools	359	795
Enrolments	11,500,000	21,800,000	Enrolments	142,000	267,000
Teachers	329,000	594,000	Teachers	9,322	14,822
Participation Rate	66.3%	99.1%	Participation Rate	2.8%	5.0%
【SECONDARY EDUCATION】			【UNIVERSITIES】		
Schools	19,000	48,487	Schools	23	43
Enrolments	4,750,000	9,150,000	Enrolments	86,000	186,000
Teachers	130,000	338,586	Teachers	4,485	6,415
Participation Rate	32.6%	49.9%	Participation Rate	0.9%	2.0%
【HIGHER SECONDARY EDUCATION】					
Schools	535	935			
Enrolments	450,000	832,000			
Teachers	8,026	14,025			
Participation Rate	7.3%	14.0%			

Source : National Education Policy '92

As a means of achieving these objectives, the long-term National Education Policy places particular importance on utilisation of mass media in the education sector such as 1) maximum utilisation of electronics and printed media, and 2) promotion of institutionalisation of the education technology to enable more specialised production of educational programmes. This is to widely extend the benefits of education to the people in general. Their contents can be summarised as follows.

- The electronic media input will form a part of systematic multi-media approach including print materials;

- Appropriate commitment in the policies of Pakistan Broadcasting Corporation (PBC) and Pakistan Television (PTV) giving necessary weightage and time to the production and transmission of the education broadcast will be obtained;

- In the field of informal learning, more attention will be paid to the effective inclusion of educational messages in the general programmes;

- The media will be used to provide pre-service and continuous in-service training to teachers at various levels;

- Radio and television will be used to provide literacy and functional education to rural females and other categories of adult learners;

- For schooling age children, special programmes for science based on school curricula will be telecast;

- Suitable arrangements at the receiving end, e.g. provision of ratio and television, its availability to viewers, its proper maintenance, etc. will be made;

- A combination of broadcasts and cassettes related to the teaching of science, medicine and technology at the tertiary level education will be made easily accessible to learners;

- The present facilities at the Allama Iqbal Open University will be upgraded to the level of an institute of communication education;

- The use of 2nd channel (ETV) will be maximised for education purposes.

Given the foregoing, this project related with basic education as something to ensure basic human rights as well as human resource development through the means of distance education is judged to have a high priority in Pakistan's national development plans.

In order to supplement the information on Pakistan, some of the social and economic indicators are shown on the Appendix-5.

(2) Outline of Education-Related Budget

1) Education Budget

Pakistan's national education budget in fiscal 1993-94 was around 34.8 billion rupees which was equivalent to around 2.2% of the country's GNP. As shown in Table 2.2, for the recent few years, the education expenses in the GNP have trended of the order of 2.2%. This is far below from 4% recommended by UNESCO for developing countries and the country must depend on foreign financial aid for development in the area of education.

Table 2. 2 Budgetary Expenditure on Education (Billion Rs.)

	1991-92	1992-93	1993-94
Development	3.86	5.39	4.87
Non Development	23.63	24.59	29.93
Total	27.49	29.98	34.80
% of GNP	2.2	2.2	2.2

Source : Economic Survey 1993-94

The long-term National Education Policy forecasts the ratio of the education budget to GNP until 2002 to range from 2.21% to 2.73%.

2) Development Budget in the Education Sector

The annual expenditure of the development budget in recent years has been as follows. While there are changes in the yearly growth rate, the share of the education and training sector in the overall development expenditure has been around 4%.

Table 2. 3 Expenditures under Annual Development Plan (Million Rs.)

SECTOR	1989-90	1990-91	1991-92	1992-93*	1993-94**
Education & Training	4,627	3,451	3,861	5,387	4,869
Manpower	250	519	319	365	411
Agriculture	3,012	3,042	3,692	3,461	2,164
Water	5,440	6,815	5,554	8,461	12,265
Power	16,399	22,204	27,410	34,414	37,744
Fuels & Minerals	2,347	6,494	10,140	11,976	19,456
Transport & Communications	8,158	15,608	22,365	35,460	38,752
Others	17,635	24,979	22,188	20,366	21,479
Total	57,868	83,112	95,529	119,890	137,140

* Revised Estimates
** Budget Estimates
Source : Economic Survey 1993-94

(3) Present State of the Education Sector

1) Status of Education

The major educational statistics of Pakistan are as follows;

Table 2. 4 Basic Statistics on Education (1993-94, estimated)

Institution	Schools	Teachers(1)	Students(2)	(Female)	(2)/(1)
Primary School	156,450	383,400	15,532,000	(4,771,000)	41
Middle School	12,638	98,400	3,845,000	(1,300,000)	39
High School	11,445	196,500	1,354,000	(495,000)	7
Secondary Vocational	712	6,850	92,000	(30,000)	13
Arts & Science College	680	18,690	595,000	(241,000)	32
Professional College	100	4,700	77,186	(19,242)	16
University	24	6,258	85,635	(11,412)	14

Source : Economic Survey 1993-94

Table 2.4 shows that the ratio of female students is low and that the number of teachers is relatively large. However, the major problem is that while there are many teachers, few are certified; hence, many are uncertified teachers. Although primary education in Pakistan is provided free of charge, it is far from compulsory. And as can be judged from such phenomena as the low literacy and participation rate and high dropout rate, the present state is that the issue of education must first be discussed from the viewpoint of development of the socio-economic position of the people as a whole. In particular, women and adult education have become particularly important issues. Also, in developing the system of primary education, the urgent issue is to increase teachers especially female in both of the areas of quality and quantity. Table 2.5 summarises the problems pointed out regarding Pakistan's education sector particularly the formal education sector.

Table 2. 5 Problems of Education Sector

【Social Problems】
Low Literacy Rate
Low Participation Rate
High Dropout Rate
Less Educational Access to Female
Education as Economic Burden to Family and Child Labour as Family Income Source
Unemployment of Higher Educational Graduates
【Institutional Problem】
Lack of Number of Teachers
Lack of Quality of Teachers
Improper Curricula
Lack of Facilities and Equipment in Schools
Imbalance of Location of Educational Facilities
Limited Educational Budget

Since it is deemed difficult to quickly surmount these problems associated with formal education, it is important to expand non-formal education such as adult education, women's education, social education, religious education and traditional education as systems to supplement the formal education. As a method for promoting such education, the Government of Pakistan has come to recognise as mentioned the efficacy of distance education for the individual students to carry out during their free hours and in places of their choice by utilising various media.

2-1-3 Distance Education and the AIOU

(1) Outline of the AIOU

The AIOU is Pakistan's only distance educational institution. Distance education is designed to promote equalisation of educational opportunities, complement formal education by adopting more specialised vocational education-related courses and develop skills, improve the quality of life and improve human resources through continued learning. An open university is established as an institution to promote distance education, and is literally a university opened to the people in general involving no restrictions such as entrance examinations as in formal education.

The AIOU was established in 1974 as a distance educational institution to

promote functional education, general education, women's education and teacher education for people who are willing to study but are not endowed with opportunities for receiving formal education for economic and physical reasons particularly adults in general, women and residents of rural areas. As shown in Table 2.6, it uses the correspondence course system using special textbooks and printed materials so that students can study during their free hours at homes or work places and education on air through broadcasting by the Pakistan Television Channel 2 (ETV) and the Pakistan Broadcasting Corporation (PBC). It is a system whereby tutors of the nearest study centre look over materials by correspondence. In addition to aid in the form of lessons utilising video and audio tapes produced for individual or group study as well as radio and television broadcasting networks, the distance education is also providing face-to-face study guidance by tutors in the evenings and on weekly holidays at 31 regional offices, 70 model study centres and 736 study centres throughout the country (See Figure 2.1).

Table 2. 6 Distance Teaching System of AIOU

a) Correspondence packages including self-learning printed texts and supplementary study materials
b) Radio and television broadcast specially prepared for distance learners
c) Tutorial instruction through correspondence and face to face at study centres and workshops
d) Course assignments as an instrument both of teaching and continuous assignment

Source : AIOU

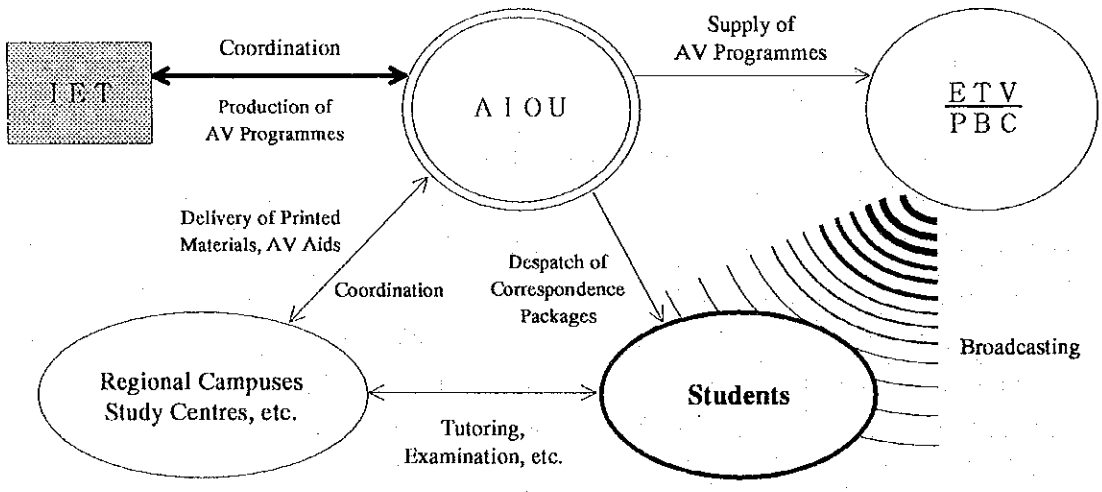

Fig. 2. 1 Concept of Distance Education by AIOU

The lessons are provided through the spring (April to September) and autumn (October to March) semesters system. Before start of the semester of each education course, students are invited through mass media such as newspapers, radio and television, and those wishing to enrol submit the application along with the tuition to the AIOU Headquarters in Islamabad, nearest regional office or designated banks. There is no entrance examination, but students wishing to enrol in the general education course must have completed the preceding course. In accordance with the number of the units taken, the students receive face-to-face lessons twice or four times at the nearest study centre and submit the study assignments to the tutor for correction.

At present, as part of non-formal education, the university is providing a wide range of educational courses from basic reading and writing for illiterate residents of remote areas and basic education on practical vocational skills to higher educational courses of university level. The students can also acquire degrees based on the credit system through the intermediate, bachelor's and master's courses. For students wishing to engage in advanced research, it has also made available a research degree system of doctor's courses. The student's records are given by combining the scores of the continuous assessment (40%) and those of the final examination (60%), and the minimum pass mark in each course is 33%. However, the passing line in the case of qualifications equivalent to formal education courses (such as B.A.s) is 40% and the scoring weights of the master's course in business administration are 30% continuous assessment and 70% final examination.

(2) Educational Activities of the AIOU

The contents of the main educational activities implemented by the AIOU are as follows;

1) Teacher Education

The following in-service programmes are being made available for teachers for the objective of improving the quality of education in schools and the administration and planning of education.

- Primary School Teachers' Certificate (P.T.C.) course:
  Designed for in-service teachers who have not received formal educational training
- Primary School Teacher's Orientation Course (P.T.O.C.):
  Guidance on the contents of all primary school subjects and lesson methods
- Certificate in Teaching (C.T.) course:
  Guidance for improving teachers' professional qualifications and competence
- M.A. in Educational Planning & Management:
  Masters course to provide teachers with effective leadership in educational planning and management
- Language Teaching courses:
  Including Arabic teacher's orientation course, college Arabic teacher's course, English language teaching course

2) Functional education

To develop immediate practical value for learners, functional education is provided on the following levels in the areas of agriculture, technology and vocation, and commerce.

- Degree and professional level
- Intermediate, technical, and vocational level
- Matric, skilled and semi-skilled level
- Sub-matric, operator and illiterate level

3) General education

Ordinary education which can also enable students to advance to higher educational courses is provided based on the following levels.

- Intermediate course (acquisition of a certificate by taking 6 credits)
- B.A. course (acquisition by taking 8 credits)
- M.A. course (acquisition by taking 10 credits)
- Ph.D. course (thesis)

4) Special programmes

When necessary, education is provided to such segment of population as local governments staff, returned labours from abroad and disabled, etc. by preparing appropriate programmes.

The foregoing educational activities are being implemented based on the education system shown in the diagram below.

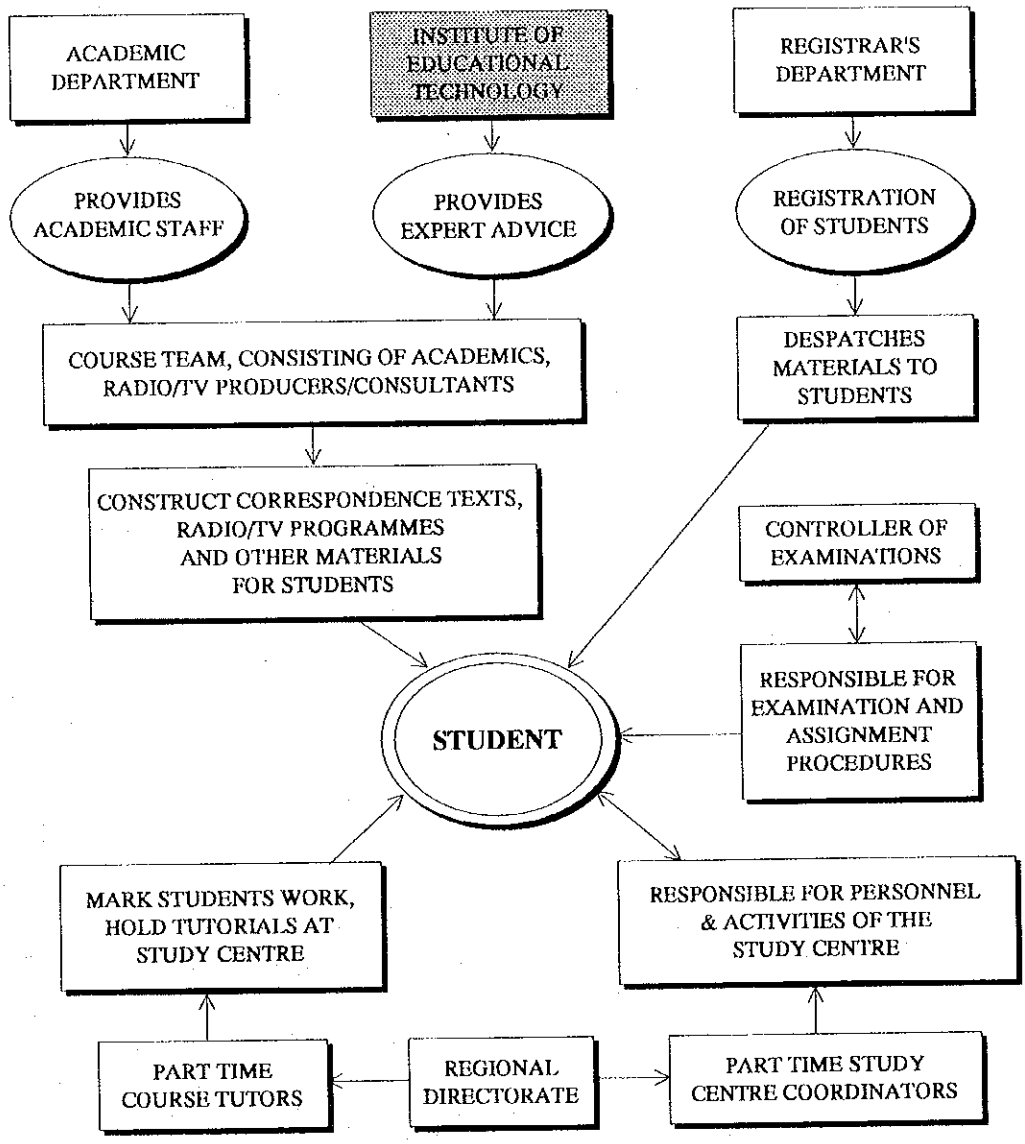

Fig. 2. 2 Educational System of AIOU

(3) Academic Staff and Students

The numbers of AIOU academic staff, enrolled students and graduates are as follows.

1) Academic staff

The AIOU's full-time academic staff by department, subject, position and qualification obtained are as follows:

Table 2. 7 Academic Staff of AIOU (As of 1992-93)

FACULTY/SUBJECTS	POST					QUALIFICATION		
	PROF.	ASSOC. PROF.	ASST. PROF.	LECTR.	TOTAL	Ph. D.	M. Phil	MA/ MSC
[SOCIAL SCIENCE & HUMANITIES]								
Arabic	1	-	-	2	3	-	-	3
Islamic Studies	1	-	-	2	3	1	-	2
Commerce	-	-	1	2	3	-	-	3
Economics	-	-	-	3	3	-	-	3
English	-	1	4	2	7	1	-	6
History, Soc. Anth. & Geography	1	1	1	2	5	-	-	5
Iqbaliat	1	1	-	1	3	2	1	-
Library & Inf. Sci.	-	-	1	-	1	-	-	1
Business Management	1	-	-	5	6	1	-	5
Communication & Mass Media	-	-	-	2	2	-	-	2
Pakistan Studies	-	-	1	3	4	-	-	4
Urdu	1	1	-	3	5	2	-	3
Sub Total	6	4	8	27	45	7	1	37
[BASIC & APPLIED SCIENCES]								
Agriculture	-	2	2	1	5	1	-	4
Basic Science	1	-	3	1	5	1	1	3
Math. Stat. & Computer Sciences	1	-	1	3	5	1		4
Science Education	-	1	-	-	1	1	-	-
Tech. & Vocational Education	1	-	1	-	2	1	-	1
Women's Education	-	1	1	4	6	1	-	5
Sub Total	3	4	8	9	24	6	1	17
[EDUCATION]								
Distance,Non-formal & Cont. Education	1	1	-	1	3	2	-	1
BPM	1	2	2	1	6	3	-	3
Special Education	-	-	1	2	3	-	-	3
Teacher Education	1	1	1	5	8	3	-	5
Sub Total	3	4	4	9	20	8	0	12
Grand Total	12	12	20	45	89	21	2	66

Source : AIOU

2) Students

The number of enrolled students is on the increasing trend as seen in the table below with the increase in the number of educational courses provided. In 1993-94, around 145,000 students have been registered. However, because most of the students

are taking several courses, the number of courses registered is around 414,000. In terms of yearly trends, the number has more or less been increasing every year which shows that the social needs for distance education have been increasing.

Table 2. 8 Course/Students/Enrolment

	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
No. of Courses	202	205	210	220	256	315
No. of Students	86,938	93,277	67,570	86,579	79,065	144,968
Course Enrolment	190,446	235,299	173,862	216,705	209,984	413,717

Source : AIOU

The table below shows the number registered by the level of educational course (only the spring term of 1994).

Table 2. 9 Course-wise Enrolment (Spring 1994)

LEVEL	COURSE ENROLMENT	STUDENT ENROLMENT
Non-credit	420	2,090
Matric	6,722	3,138
Intermediate	23,985	11,026
B.A.	23,563	10,204
M.Sc.,M.Phil.	9,931	1,521
Teacher Education	268,339	73,588
P.T.C.	184,512	50,490
P.T.O.C.	7,247	-
C.T.	64,119	17,056
B.Ed.	10,395	5,300
M.Ed.	833	187
M.A.(EPM)	500	302
T.E.F.L.	733	253
TOTAL	332,960	101,567

Source : AIOU

The statistics for the spring semester 1994 show that the most frequently registered among the AIOU's educational courses is the Primary School Teacher's Certificate (P.T.C.) course accounting for around 55% of all registrations. This was followed by the Certificate in Teaching (C.T.) course's around 19%, intermediate course's 7%, B.A. course's 7%, B.Ed. course's 3%, matric course's 2%, graduate course's 3% and Primary School Teacher's Orientation Course (P.T.O.C.)'s 2%.

The students' gender ratio is 65% males and 35% females. However, in the case of the P.T.C. course which is most often registered, the ratio is reversed with 49% males and 51% females. Also, while 42% of the students are residents of urban areas, 58% are those of rural areas. This coincides with the current of the policy to increase the number of female teachers being promoted by the Ministry of Education as part of the measures to expand the educational opportunities for women particularly those of rural areas.

In terms of age composition, the students are most frequently in their 40s (37%) followed by 30s (25%), 20s and 50s (both 15%), 10s (7%) and 60 and over (1%). By occupation, 40% are employee of public sector, 40% employees of private enterprises, 7% students (full-time), 5% housewives, 3% business and 1% farming and other. In terms of family income, 46% were in the low-income group (monthly income of 500 rupees or under), 26% in the medium income group (monthly income of 501-1,000 rupees), 18% in the highest income group (2,001 rupees and over) and 10% in the high income group (1,001-2,000 rupees). These show that adults who belong to relatively poor classes and were not able to acquire sufficient educational opportunities are wrestling with life-long learning based on their own will.

In terms of the statistics from the time of start of the AIOU to the 1991 spring semester, the cumulative course enrolment is 1,485,198. Among these, the number of final examinations taken was 747,383 and the number passing was 558,020. Therefore, the average passing rate of final examinations for the entire school was 75% and the dropout rate was 48%. The number of those completing the courses since the establishment of AIOU to the end of February 1994 has been 197,330. Among them, 170,767 acquired the prescribed certificates or degrees.

(4) Regional Service Networks

The regional service networks occupy an important part in the distance education implemented by the AIOU. To provide correction guidance by correspondence, face-to-face lessons, workshop exercises and examinations for students who study at home and work places, regional campuses, regional centres, model study centres, general study centres and technical study centres have been established as follows throughout the country. Among these, many of the model study centres are equipped with basic sets such as colour television receivers, slide projectors, radio-cassette players, automatic viewers, headphones, overhead projectors and audio-visual equipment. Many of the regional

campuses and centres have videocassette recorders in addition to the basic sets and these are used in providing face-to-face lessons and workshop exercises. The model study centres also have small libraries which students can use when studying by themselves.

Table 2. 10 AIOU Regional Service Network

	Regional Campus	Regional Centre	Model S. Centre	General S. Centre	Technical S. Centre
N-W.F.P.	1	4	11	110	8
Balochistan	1	2 (2)	1	33	3
Sindh	2	6 (1)	15	160	83
Punjab	4	6	30	232	53
AJK	1	1	9	23	11
Nor. Areas	0	2	3	10	0
Fed. Areas	0	1	1	8	2
Total	9	22	70	576	160

Figures in ( ) show part-time centres.
Source : AIOU

Part-time tutors are stationed at the centres to guide students, provide lessons and mark examination sheets. The total number of tutors greatly changes depending on the number of the courses which varies semester by semester, but roughly 3,000 are being employed. Many of these are in-service school teachers.

(5) Institute of Educational Technology (IET)

The Institute of Educational Technology was established with the initiation of the AIOU in 1974 for the objective of producing supplementary teaching aids used by the AIOU in providing distance education. The teaching aids such as audio and video programmes (for broadcasting and non-broadcasting), illustrations and flip charts among the teaching aids used in the AIOU's distance education are all produced by the IET. The IET building comprises facilities such as a TV studio, radio studio, photography studio, graphic design studio and auditorium completed in 1983. The IET's main functions are summarised below.

Table 2. 11 Main Function of the IET

a) To develop and produce radio and television programmes for various courses of AIOU
b) To develop audio-cassette and illustrated audio-visual books for AIOU students as distance learning aids
c) To assist AIOU's regional offices and study centres in proper utilisation and maintenance of their audio-visual equipment
d) To guide and advise other governmental and non-governmental agencies in the development of their broadcast and non-broadcast educational materials
e) To enter into contract with these agencies for the development and production of such materials
f) To initiate and conduct research in the area of educational technology

Source : AIOU

In developing and producing the teaching aids for distance education which comprise the IET's main activities, indispensable is co-operation with the academic staff of the AIOU teaching departments and faculties. For this reason, from the phase of designing the teaching aids, IET staff are participating in committee of courses as permanent members. Table below shows the number of audio-visual teaching aids produced by the IET since 1989.

Table 2. 12 Programme Production at the IET (1989 - 1994)

PERIOD	FOR BROADCASTING		NON-BROADCAST	
	RADIO	TV	Audio	Video
Jan.-Jun. 1989	100	13	30	11
Jul.-Dec. 1989	113	5	7	1
Jan.-Jun. 1990	87	10	-	-
Jul.-Dec. 1990	88	10	21	-
Jan.-Jun. 1991	58	3	17	-
Jul.-Dec. 1991	58	3	17	-
Jan.-Jun. 1992	26	11	-	-
Jul.-Dec. 1992	30	18	9	3
Jan.-Jun. 1993	30	13	24	-
Jul.-Dec. 1993	29	13	24	-
Jan.-Jun. 1994	30	30	-	-
Jul.-Dec. 1994	26	20	7	-

Source : AIOU

At present, the video teaching aids for broadcasting produced by the IET are being broadcast one hour (two programmes) a day by ETV throughout the year. There are also plans for the Ministry of Education to commission the production of video teaching aids for formal education to the IET, and the related agencies are carrying on consultation

in the direction of expanding the televising hours. As a consequence, there is a plan of increasing the hours to 1.5 hours (three programmes) a day in the near future and then to two hours (four programmes). On the other hand, as for audio teaching aids, those related with courses taken by over 500 students are radio-broadcast through PBC. As for the teaching aids for courses taken by fewer students, audio tapes are sent for group study at study centres or individual study at homes. At present, while there are daily changes, the AIOU's audio teaching aids broadcast through the PBC number one to three programmes (15-45 minutes) a day, and the period of broadcasting is limited to the period during which the semester's lessons are provided (4.5 months each in spring and autumn). The following table shows the number of the audio-visual programmes transmitted through the ETV and the PBC.

Table 2. 13 Programmes Transmitted

Period		Radio	TV
Spring	1989	406	77
Autumn	1989	321	75
Spring	1990	351	69
Autumn	1990	234	48
Spring	1991	234	53
Autumn	1991	229	40
Spring	1992	175	19
Autumn	1992	169	318
Spring	1993	250	364
Autumn	1993	223	364
Spring	1994	260	364
Autumn	1994	252	364

Source : AIOU

The IET's organisation can roughly be divided into the production division and the general affairs and management division. The production division which is directly engaged in production of teaching aids has a programme production section, art and graphics section, engineering section, material co-ordination section, archives section and scripts cell. Among these, the major sections are carrying out the following activities.

1) Programme production section

As members of the AIOU's course development teams, the producer is participating from the planning and programming phase for production of audio-visual programmes and is leading the production of teaching aids at the IET.

2) Art and graphics section

The designers, illustrators, calligraphists, cartographers, photographers, etc. who belong to this section are in charge of production of the arts, graphics and illustrations used as supplementary teaching aids.

3) Engineering section

This section is in charge of operation and maintenance of the equipment used in producing video and audio teaching aids such as studio equipment, editing equipment and dubbing equipment, etc. It is staffed by trained engineers and technician in the field of television, radio, electronics and so forth. This section also takes cares of the audio-visual units of the regional offices and study centres.

4) Material co-ordination section

This section is in charge of distributing produced teaching materials to regional offices and study centres as well as to the individual students.

5) Archives section

Master copies of all media productions are maintained by this section. These master copies are used only for dubbing and duplication purposes.

(6) Production of Teaching Aids

Fig.2.3 shows the process of production of course materials for audio-visual programmes by the AIOU and IET. Establishment of a new educational course starts with a course proposal. The courses are initiated by a directive from higher authorities, a request from an outside agency, the university's already envisaged policies and plans, meetings of the statutory bodies, and the concerned academic departments own staff meetings. The adoption or not of a new course is determined by examining the possible students (employees, housewives, businessmen, etc.), attractiveness for the students (such as on-the-job training, self-employment, future job prospects and self-satisfaction, etc.) and the number of prospective students by taking account of the course's economic efficiency. In determining the course level, a committee of course chaired by the chairman of the related department and mainly made up of a course co-ordinator is

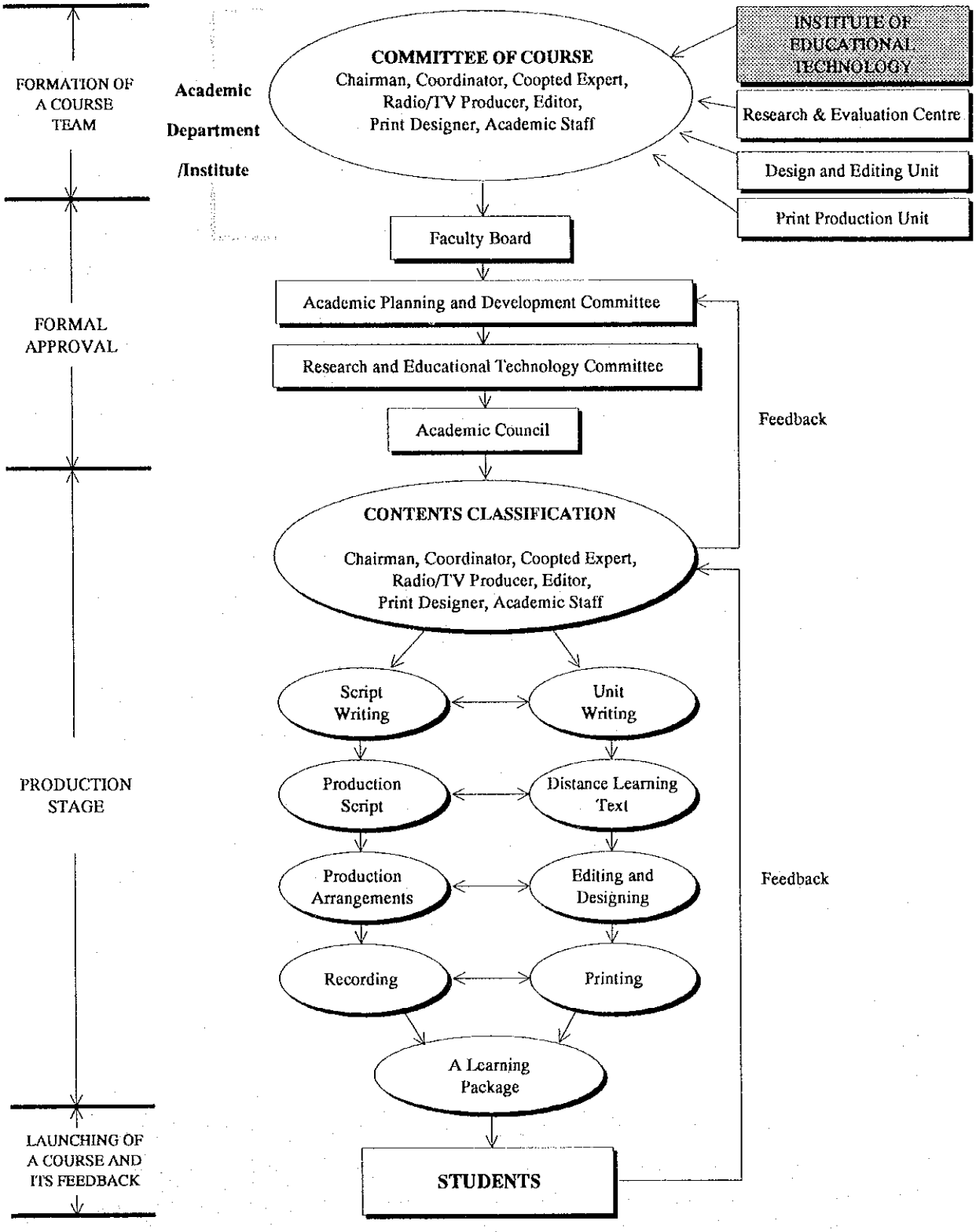

Fig. 2. 3 Procedure for Promotion of Course Materials

organised, and in the occasion of a committee opened through participation by IET producers and other divisions' specialists, the details namely the course's number of credit, period and composition of the teaching aids (such as prints, radio and video programmes, the language used and face-to-face lessons) are determined.

The course proposal approved by the relevant committee of course is submitted to a faculty board chaired by the dean. After the necessary corrections are added, it is submitted to the academic planning and development committee (a committee to examine the contents of the education course) or the research and educational technology committee (an advisory committee on production of broadcast and non-broadcast teaching aids). After being deliberated on by these two committees, the course proposal is submitted to the academic council which is the AIOU's highest deliberative organ in the area of academics which finally determines the course's adoption or not.

Hence, the production of the teaching aids for the officially determined education course is started. A course team, comprising members of the committee of course, formulates work plans by kind of the teaching aids to be produced, and carries out the work in accordance with production procedure set for each material. The prints are produced by the AIOU's design and editing cell and print production unit, and the audio-visual teaching aids by the IET. The completed learning packages are mailed by the AIOU's mailing section to the regional offices or the students' homes all at once.

A special task group is also organised to monitor the activities of the related sections and control the schedule during the period of production of the teaching aids. Through meetings held around twice a month, a mutual monitoring system has been developed to ensure smooth teaching aid production.

2-2 Study and Examination on the Request

2-2-1 Necessity of the Project

The main educational activities implemented by the AIOU can roughly be divided into teacher education, functional education, general education and special programmes. AIOU is implementing these kinds of education on a national scale by using diverse media. Such activities through distance education are supported as follows by Pakistan's national development plans and education policies.

(1) Priority based on national development plans

Pakistan's national development plan seeks to achieve universal primary education and to drastically increase the literacy rate. It makes thorough extension of basic education the top priority issue.

(2) Compatibility with the National Education Policy

The goals of the long-term National Education Policy encompass all of the sub-sectors of the education sector. In particular it seeks to thoroughly implement basic education centred around primary education, expand women's and adult educational opportunities through informal education and distance education and expand teacher education. In particular, the distance education using mass media is highly being evaluated as a method for extending education to the increasing population, and specifically demanded are establishment of the technology for producing teaching aids used in distance education and strengthening of the functions of the IET which is an institution for producing such teaching aids.

(3) Examination from the viewpoint of social needs

The social needs for the AIOU's distance education courses have steadily been increasing every year. This is clear when comparing the time at the initial stage of AIOU in fiscal 1975-76 and the present as the number of educational courses have drastically grown by around 52 times and the number of courses registered by 423 times. Also, at the AIOU, many adults who belong to relatively poor classes and were not able to acquire sufficient educational opportunities are wrestling with life-long education based on their own will. In this sense, the AIOU can be said an important educational institution in which social needs and policy objectives coincide.

Judging from the foregoing, this project designed to update the equipment of the IET which is producing all of the audio-visual teaching aids for distance education used by the AIOU is considered appropriate.

2-2-2 Present State of the Equipment

The equipment presently used at the IET is the one provided through the UNDP and British ODA in 1979, and the format of the videocassette recorders (VCRs) used in such

purposes as editing video images is of the U-Matic low-band type. The video grade of the U-Matic low-band equipment is four to five generations older than that of the present video technology. When limited to production of video programmes of the level of broadcasting, there are no cases in which it is still being used in Japan or any other country. Also, the 3/4" tape used under this format is expensive compared to the 1/2" tape now mainly used which has been increasing the equipment's running cost. It has hence become an equipment with poor economic efficiency.

These items of equipment have been in use for over 15 years since they were introduced. Although they have become markedly superannuated, they are being maintained in a good state, and most of them are still fully operating today. From this, it is believed that the AIOU/IET have sufficient technical capacities, and it is judged that there will be no problems in their project execution capacity. However, when consideration is given to provision of programmes to the ETV which is expected to drastically increase in the future, it will be necessary to develop both the quality and quantity of the teaching aids produced by updating these items of equipment to those which are compatible with the system that has now become the main current in the world. From such a viewpoint, it is desired to quickly develop the IET's equipment.

2-2-3 The Reality and Appropriateness

At present, the IET is producing audio-visual teaching aids with a system of 14 production staff headed by the senior producer, 16 engineering staff headed by a chief engineer and 18 support staff headed by a chief designer. Its current facilities consist of a TV studio, two editing systems, a recording studio and an outdoor news-gathering vehicle. It is carrying out production activities by co-ordinating the projects' schedule.

On the other hand, to cope with the increasing social needs for distance education, the AIOU and IET are planning to produce around 100 video and 400 audio programmes a year by using both the existing and new equipment regarding the teaching aid software to be supplied to broadcasting stations and non-broadcast teaching aid software. To cope with such functional expansion, this project includes a field production vehicle which can also be used in gathering materials outdoors in addition to the main studio facilities. This vehicle can also virtually be considered a studio facility. Moreover, the IET is planning to construct a sub-studio exclusively for use in technically training the staff and producing non-broadcast teaching aids by moving the existing equipment to the room which is now being used as a storage room of stage settings and properties. Therefore, the conceptual diagram of the

production system after introduction of the new equipment will be as shown in Fig. 2.4.

As a result of the foregoing, the IET will have two TV studios (one main and one sub), five editing systems, one recording studio, two outdoor news-gathering vehicles (including the current one) and one field production vehicle. In terms of facilities, this will achieve the scale sufficient in producing the planned number of teaching aids. Therefore, if the items of equipment are introduced based on this project and the plan for increasing the personnel as discussed earlier progresses as scheduled, it will fully be possible to produce around 100 video and 400 audio teaching aids a year, which can be judged to contribute toward expanding the functions of the distance education as planned by the AIOU.

For such reasons as that the project's effects, compatibility with the reality and the execution capacity of the Pakistan side have been confirmed through the foregoing examination, and that the projects' effects coincide with the system of grant aid, implementation of grant aid by Japan has been judged as appropriate. Hence, by assuming grant aid by Japan, the following sections will examine the project's outline and formulate its basic design.

2-3 Project Description

2-3-1 Executing Agency and Operational Structure

(1) Administering Agency in Charge

The agency in charge of the Government of Pakistan related with this project is the Ministry of Education. Its Planning and Development Wing will serve as the liaison office. In executing this project, the Ministry of Education will carry out the management operation so that it is not necessary to specially increase personnel.

(2) Project Executing Agency

The executing agency of this project is the Allama Iqbal Open University. The AIOU executes the budget related with the works to be borne by the Pakistan side related with this project. The equipment to be provided through the project is to be installed in the existing building of the Institute of Educational Technology which will be in charge of operation and maintenance of the equipment.

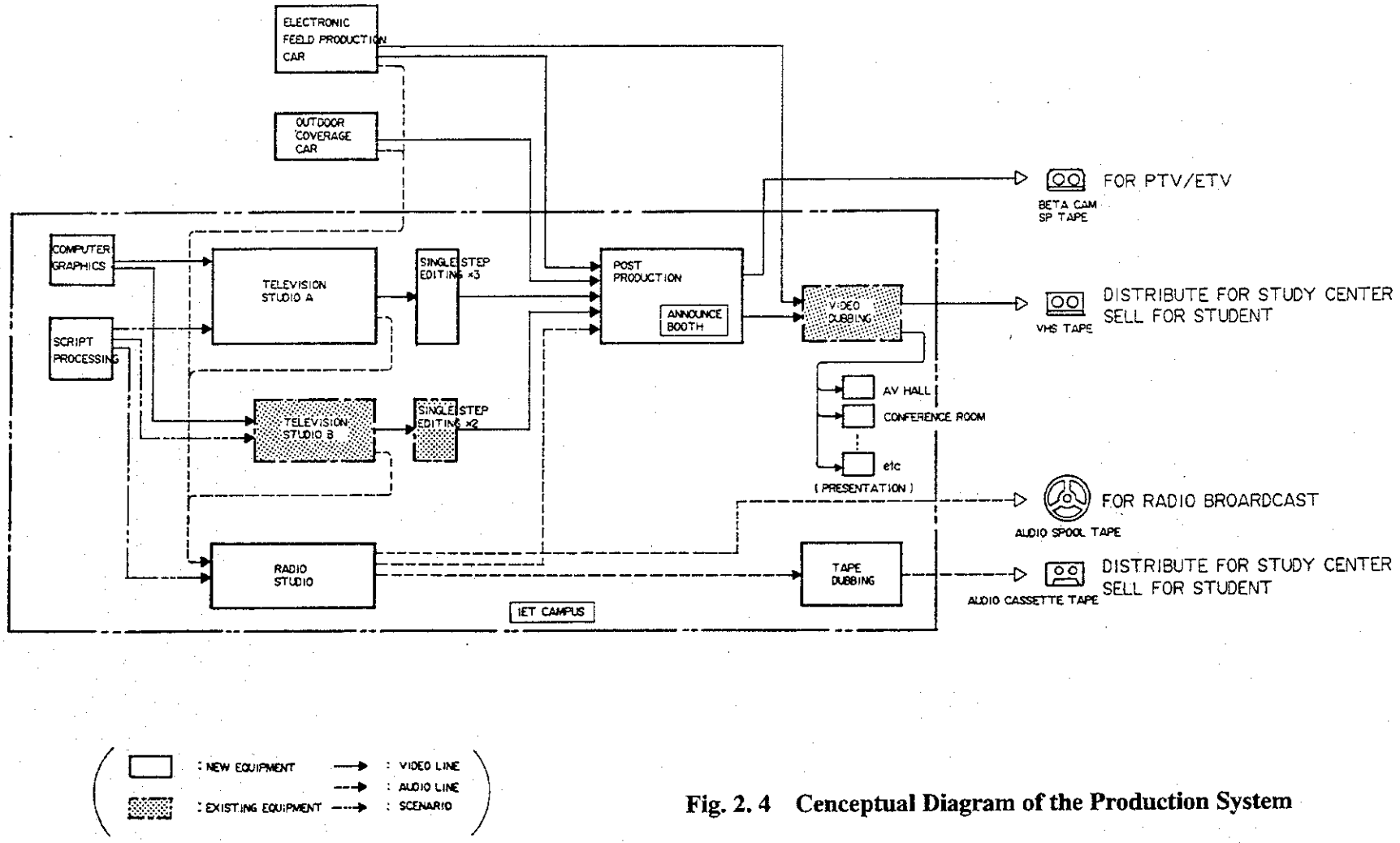

Fig. 2. 4 Cenceptual Diagram of the Production System

Table 2.14 shows the number of the AIOU's full-time academic staff, officers and other service staff. Fig.2.5 shows its organisation chart.

Table 2. 14 Personnel of AIOU

〔AIOU HEADQUARTERS〕	
Teaching Staff *	90
Officers(BPS-17~20)	102
Staff(BPS-1~16)	635
〔REGIONAL OFFICES〕	
Officers(BPS-17~20)	29
Staff(BPS-1~16)	193
Total	1,049

* Including Professors, Associate Prof., Assistant Prof.,Lecturers

Source: AIOU

2-3-2 Plan of Activity

(1) Institute of Educational Technology

The present IET's programme production section has three senior producers, one producer and five assistant producers. These are forming teams to produce audio-visual teaching aids. The engineering section actually operates, maintains and controls the equipment. Sixteen engineers, technicians and skilled personnel are similarly forming teams and engaged in producing teaching aids. The art and graphics section is in charge of various arts, illustrations, photographs, settings and properties. Eighteen staff are engaged in the operations they specialise in. In preparing for the increase in the operation volume when this project is executed through grant aid, the IET is planning to include 26 new personnel in 1995-96 AIOU budget (5 of these are to be assigned to the production section, 13 to the engineering section, 2 to the design section and 6 to the main office). The table 2.15 shows the personnel list of the IET as a whole including these additions. If the personnel increase plan progresses as planned and the equipment is introduced through this project, the IET will have a capacity to produce around 100 video and 400 audio programmes a year. The personnel increase is estimated to raise the IET's personnel expenses by around 2.1 million rupees a year.

One of the main activities of the IET is to provide its personnel with on-the-job training. The IET engineering section's main engineers have the experience of having worked for the Pakistan Television Corporation or Pakistan Broadcasting Corporation. These engineers are to serve as trainers and train the other existing staff and new staff.

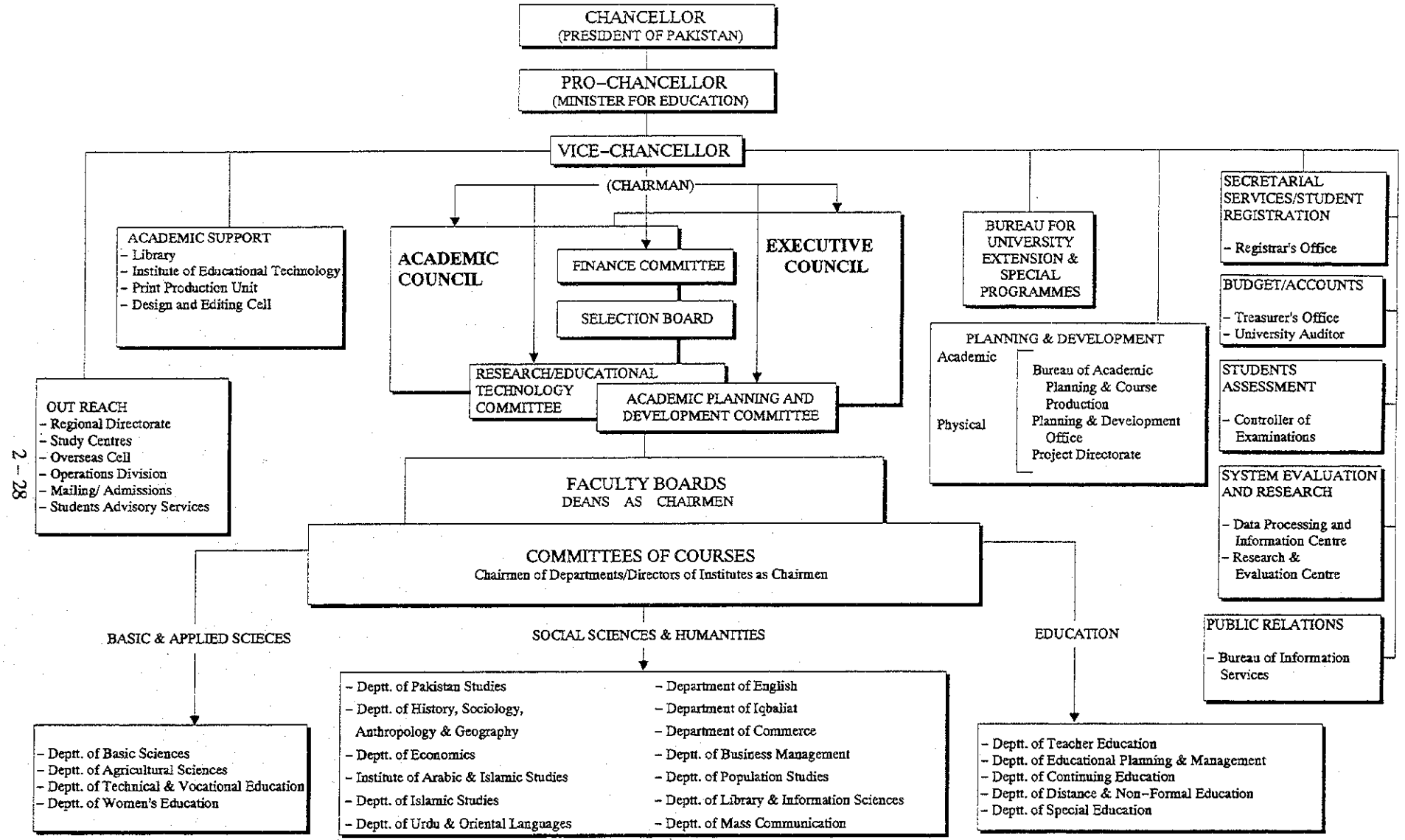

Fig. 2. 5 AIOU Organization Chart

Table 2. 15 Working Staff of the IET

SECTION/POST	GRADE	CURRENT No.	ADD. No.	TOTAL
【MAIN OFFICE】				
Director	20	1	–	1
Deputy Director	19	2	–	2
Sr. Material Coordtr.	18	–	1	1
Material Co-ordinator	17	1	–	1
Supdt/Accountant	16	1	1	2
Stenographer	15	1	–	1
Assistant	11	1	–	1
T.S.K.	11	2	–	2
L.D.C.	5	2	–	2
Driver	5	1	–	1
Naib Qasid	1	2	4	6
Sub Total		14	6	20
【PRODUCTION】				
Sr. Producer	18	3	2	5
Producer	17	1	2	3
Asstt. Producer	16	5	–	5
Make-up-artist	11	1	1	2
Jr. Cartographer	11	1	–	1
L.D.C./Typist	5	1	–	1
L.D.C.	5	1	–	1
Naib Qasid	1	1	–	1
Sub Total		14	5	19
【ENGINEERING】				
Chief Engineer	19	1	–	1
Sr. Engineer	18	1	–	1
TV Engineer	17	3	3	6
Electrical Engineer	17	–	2	2
Associate Engineer	16	3	4	7
Lighting Technician	16	2	–	2
Cameraman	16	2	2	4
Lighting Assistant	11	1	–	1
O.B. Helper	5	2	–	2
Cable Boy	5	–	2	2
Naib Qasid	1	1	–	1
Sub Total		16	13	29
【DESIGN】				
Chief Designer	19	1	–	1
Sr. Designer	18	2	1	3
Designer	17	1	–	1
Tech. Illustrator	17	1	–	1
Calligraphist	17	1	–	1
Sr. Photographer	17	1	–	1
Cartographer	16	1	–	1
Asstt. Photographer	16	1	–	1
Assistant	11	1	–	1
Jr. Calligraphist	11	1	–	1
Asstt. Cartographer	11	1	–	1
Asstt. Calligraphist	11	1	–	1
Electrician Grade-A	11	1	–	1
Jr. Lab Assistant	5	1	–	1
Carpenter	5	1	1	2
Painter	5	1	–	1
Naib Qasid	1	1	–	1
Sub Total		18	2	20
【ARCHIVES】				
AV Archivist/Producer	17	1	–	1
L.D.C.	5	1	–	1
Naib Qasid	1	1	–	1
Sub Total		3	0	3
Grand Total		65	26	91

Source: AIOU

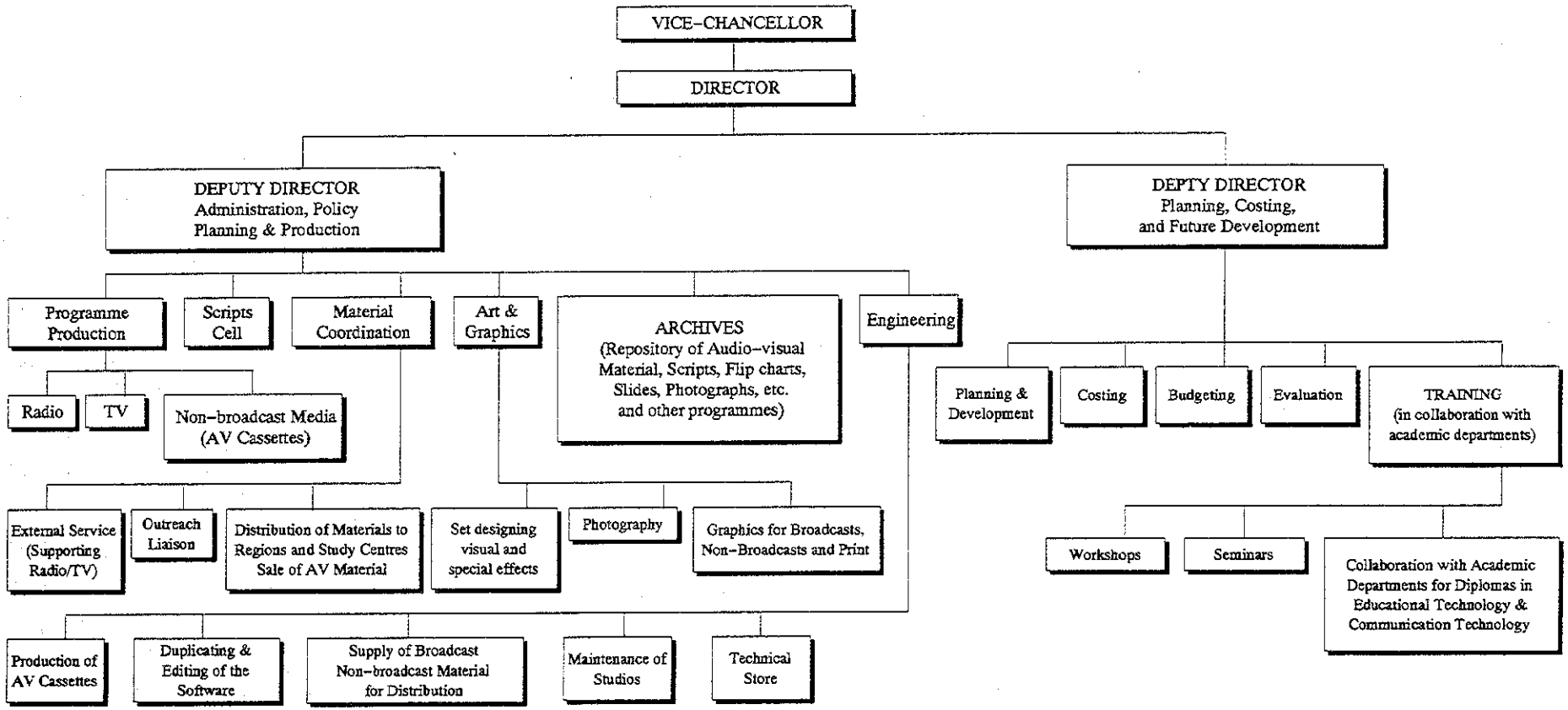

Fig. 2. 6 IET Organization Chart

(2) Budget

The AIOU's main source of income is the government grant in aid supplied from the Ministry of Education through the University Grants Commission. It depends on this grant for the personnel expenses which account for a considerable portion of the AIOU expenditure as well as for the budget for new development projects. However, with the increase in the number of the students in the recent years, the income from tuition has also been increasing. In terms of the fiscal 1993–94 record, around 60% of the ordinary income has been from sources other than government grant in aid such as tuition. When compared with other universities in Pakistan, the AIOU's self–income rate is the highest. The recent trends of the AIOU's cash flow have been as follows.

Table 2. 16 Recurring Income & Expenditure of AIOU (Thousand Rs.)

ITEM	1989–90	1990–91	1991–92	1992–93	1993–94	1994–95
【INCOME】						
Govt. Grant in Aid	34,310	36,544	38,234	47,798	50,188	85,000
Income of Fee etc.	17,265	28,500	30,000	31,598	96,670	100,000
Other Income	3,015	6,583	1,300	9,871	12,945	3,600
Total	54,590	71,627	69,534	89,267	159,803	188,600
【EXPENDITURE】						
Pay	19,615	20,050	26,805	31,503	28,104	50,423
Regular Allowance	7,092	10,877	11,763	8,923	9,235	18,377
Other Allowance	1,163	1,120	1,610	911	2,029	4,100
Personnel Cost (Total)	27,870	32,047	40,178	41,337	39,368	72,900
Miscellaneous	37,228	46,221	54,967	56,277	72,083	136,860
Total	65,098	78,268	95,145	97,614	111,451	209,760

Source : AIOU

Among the expenditures, the expenses related with operation and maintenance of the AIOU equipment and facilities comprise around 5% of the entire amount. When consideration is given to the fact that while this project will introduce new equipment, it is basically designed to update old equipment, and the fact that the decrease in the operation and maintenance expenses such as due to decrease of the unit cost of video tapes and the increase in the operation cost due to increase of the number of the programmes produced will offset each other, it is believed that there will not be great changes in this ratio even after the new equipment is introduced through this project. Also, the increase in the personnel expenses due to the planned increase of the IET staff of around 2.1 million rupees a year is around 1% of the total expenditure during the current fiscal year. In contrast, in the area of incomes, both the government subsidies and tuition have favourably been increasing by 2.5 and 5.8 times (around 1.5 and 3.4 times even when compared by converting into US dollars) during the last five years. And when consideration is given to the higher priority of distance education in the national plans and

the further demand increase which is expected to occur, this tendency of budget increase is believed to continue in the future. Therefore, it can be said that there will be no financial problems in executing this project.

2-3-3 Conditions of Project Site

(1) Natural Conditions

The city of Islamabad where the site is located is situated on a height of 511 meters above sea level, and the mean monthly temperature, mean daily maximum temperature, mean daily minimum temperature, relative humidity and the precipitation during the period from 1961 to 1990 are as follows.

Table 2. 17 Climatic Condition

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Year
Ave. Temp.	10.1	12.1	16.9	22.6	27.5	31.2	29.7	28.5	27.0	22.4	16.5	11.6	21.3
Max. Temp.	17.7	19.1	23.9	30.1	35.3	38.7	35.0	33.4	33.5	30.9	25.4	19.7	28.6
Min. Temp.	2.6	5.1	9.9	15.0	19.7	23.7	24.3	23.5	20.6	13.9	7.5	3.4	14.1
Relat.Humidity	85.0	83.0	75.0	61.0	45.0	46.0	71.0	81.0	75.0	73.0	80.0	85.0	72.0
Rainfall(mm)	56.1	73.5	89.8	61.8	39.2	62.2	267.0	309.9	98.2	29.3	17.8	37.3	95.2

Temperatures : Mean Daily in ℃ Relative Humidity : in %
Source : AIOU

The weather is mostly fine except during the rainy season of July and August. However, because the city is near the northern mountainous zone, even during the dry season, there is sometimes heavy rain which sometimes continues for around a week. The amount of precipitation is the greatest among the major cities.

Except for those to be used outdoors, the equipment to be provided through this project will be installed indoors where there are air conditioning facilities, and the room temperature will be kept from 18 to 22℃ and the relative humidity from 30 to 35%.

Earthquakes frequently occur in northern Pakistan including Islamabad so that the IET building in which the equipment will be installed has been designed earthquake-proof. As for the equipment to be provided, it is necessary to design the facilities to store them by taking account of earthquakes to some degree.

(2) Infrastructural Conditions

1) Electricity

Electricity is supplied by the Water and Power Development Authority (WAPDA) and is sent to the IET and other various buildings of AIOU through the substation on the AIOU premises. The voltage and frequency are as follows.

Three-phase AC 440V : ±1.25%
Single-phase AC 220V: ±2.5%
Frequency: 50Hz ±1%

Pakistan however does not have sufficient water quantity for power generation. The supply is particularly tight during the dry season, and the country is dealing with power shortage by implementing load-shedding. Islamabad which is the capital city is no exception. While this also depends on precipitation, sometimes the power is stopped for as long as around eight hours a day. Although the IET has emergency power generators, their capacity is not sufficient.

2) Roads

Roads are very well developed in Islamabad. While the traffic is somewhat disordered as signals go off during occasional power stoppage, the traffic volume is small and there are no backups. On the AIOU premises also, there are major paved roads about seven meters wide. The parking lots are sufficiently large, and there will be no problems in bringing in the equipment into the AIOU compound as well as into the IET building. The site is at a distance of 1,580km by land route from the city of Karachi which has Pakistan's largest sea port. Because the two cities are connected by paved roads all through the route, there will also be no problems in terms of inland transport by land routes.

3) Water supply

Islamabad has a dam lake named Rawal Lake within its boundary. Its water however is mainly supplied to the nearby city of Rawalpindi, and the water supplied to Islamabad is taken from the northern mountainous area. Service water is sufficiently being supplied to the AIOU. In addition to water supply through taps and

for toilets, the water is being used in the air conditioning facility as cooling water. None of the equipment to be provided through this project uses water and, therefore, there will be no problem in this regard.

4) Buildings

Table below shows the main room composition of the IET's existing building. Figure 2.7 shows the AIOU's premises map.

Table 2. 18 Technical Area of the IET

NAME	SIZE	AREA(m^2)
TV Studio	60'-9" x 36'-00	203.2
Prod. Control 1	17'-6" x 10'-00	16.3
Prod. Control 2	17'-6" x 10'-00	16.3
Audio Control	17'-6" x 10'-00	16.3
Telecine	22'-6" x 10'-00	20.9
VTR Editing 1	15'-00 x 10'-00	13.9
VTR Editing 2	15'-00 x 10'-00	13.9
Video Dubbing	15'-00 x 10'-6"	14.6
Maintenance	15'-00 x 10'-2 1/4'	14.2
Sound Transfer	18'-00 x 12'-00	20.1
Radio Control 1	24'-9" x 12'-00	27.6
Radio Control 2	12'-00 x 12'-00	13.4
Radio Studio 1	24'-9" x 17'-1 1/2"	40.5
Radio Studio 2	31'-6" x 24'-9"	71.2
Engineering Store	20'-9" x 17'-6"	33.7
Eng'g Incharge	15'-00 x 10'-00	13.9
Light Camera Store	31'-6" x 6'-10"	29.3
Council Hall	(Rounded)	193.1
Auditorium	50'-00 x 61'-6"	285.7

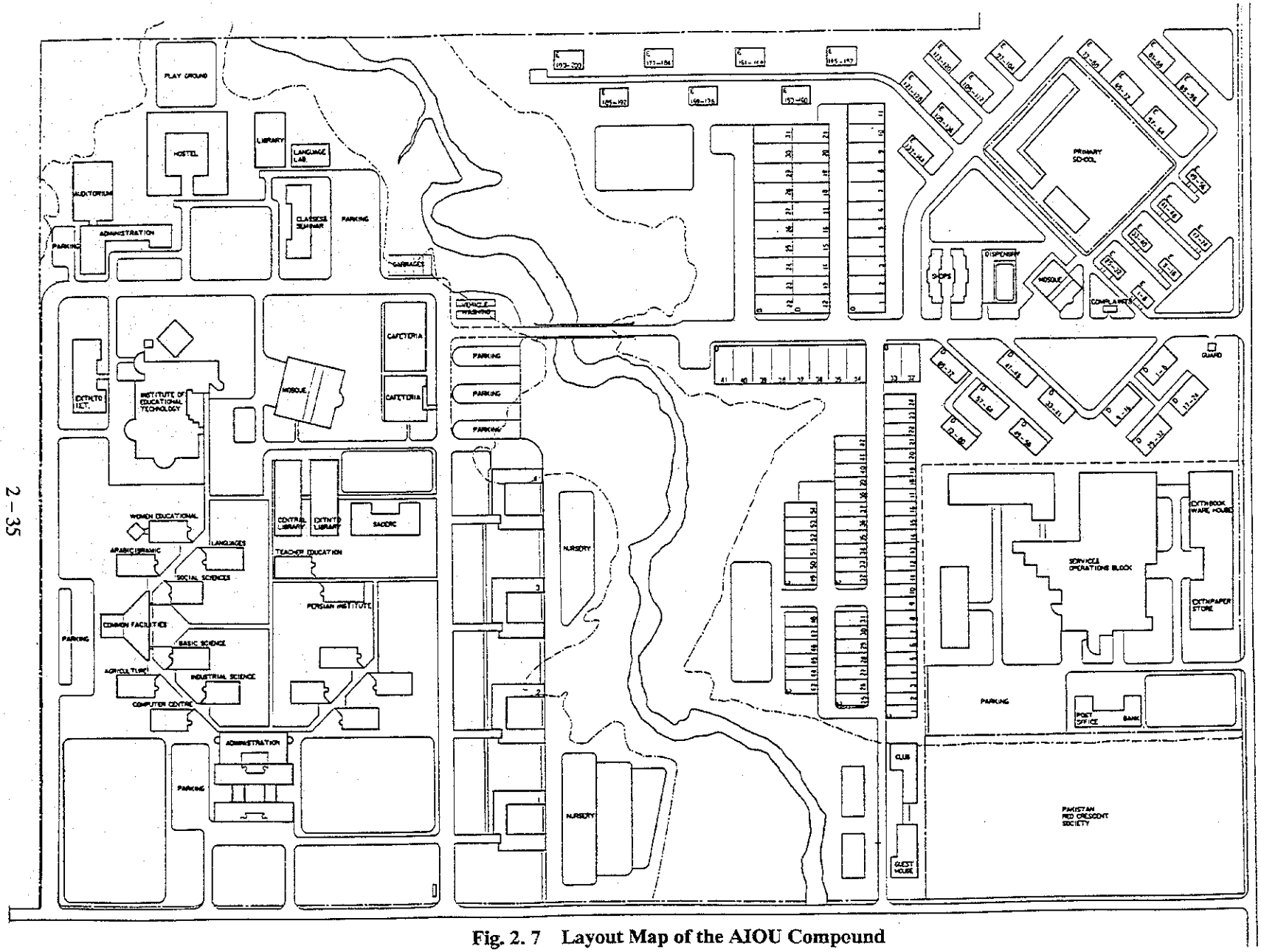

Fig. 2. 7 Layout Map of the AIOU Compound

2-3-4 Outline of Equipment

The component and function of the systems and equipment needed for the project are defined as follows;

A) TV Studio:

This studio is used for producing video teaching/learning materials. Various shootings of performers and phenomena as well as of TELOPs and patterns of charts and drawings will be done in this studio.

Major Equipment

Colour Camera Chain
Flyingspot Scanner
Character Generator
Video Production Equipment
Audio Production Equipment
VCR (1/2" Broadcast Standard)
Monitoring Equipment
Studio Intercom Equipment
Lighting Equipment

Functional Outline

- Present TV studio has a floor area of approx. 200m^2. This size is good enough for producing ordinary educational programmes of lecturers, scientific experiments, discussions, music performances, etc. Ordinary shooting of a TV programme in a studio is done by three TV cameras, each one being located in the centre, right side and left side respectively. However, educational programmes can be shot by using only two cameras instead of three due to less frequent movement of objects. Since IET is planning to maximise the efficiency of studio use by shooting two situations in parallel, four sets of TV cameras are needed for this purpose.

- Effecting apparatus will be of component type in order to avoid degradation of video quality, and digital effect function will be added to them so that the produced educational programme is attractive and effective. Input to these

effecting apparatus will be done through cameras, flyingspot scanners, a character generator, and VCRs. Quantity of each equipment will be determined according to the minimum needs as a system component.

- TV studios, which produce colour video programmes, ideally need lighting of min. 700W/m^2. Assuming that the effective working range of colour video shooting is 55%, this studio of IET needs power supply of approx. 100kVA. Although Pakistan side is planning to prepare maximum power supply of 100kVA (three phase) for lighting purpose in the IET building, 30kVA will be needed for lighting in the second (sub) TV studio that will be established after the existing studio equipment is shifted to other space currently used for storage of settings and properties. Therefore, the lighting equipment for the main TV studio will be selected in the manner that their power consumption in total does not exceed 70kVA.

B) Central Apparatus Room:

This is a key to control TV studio system.

Major Equipment

Sync Signal Generator
Television Generator
Automatic/Manual Change Over Unit
Video Distribution Amplifier
Audio Distribution Amplifier
Pulse Distribution Amplifier
Video/Pulse Delay Unit
Rack Assembly
Master/Slave Clock System
Telecine Chain
Signal Distribution System
Room to Room Communication System
System Converter
VHF Communication System

Functional Outline

- Capacity of signal distribution will be determined according to the minimum requirement for system composition, while future expansion of the system being taken into consideration. Two sets of sync signal generator will be provided so that the signal will be switched over automatically to the other unit when one unit faces sudden trouble.

- A master/slave clock system will be installed for keeping time correct in each room. Since this clock system is to be used only for studio production but not for broadcasting, such function of time calibration with the Pakistan standard time is not necessary.

- The VHF communication system will be used solely for communication between the IET headquarters and outside Field Production Car on location, but not for outdoor relay telecasting. AIOU shall obtain a license for this communication system whenever it is required by the relevant laws of Pakistan.

C) Editing Room:

Video tapes recorded elsewhere will be edited in this room through single step editing system.

Major Equipment

Automatic Editing Control Unit
VCR (1/2" Broadcast Standard)
Monitoring Equipment
Headphone

Functional Outline

- Ordinary video shooting produces recorded tapes in length four to five times more than the final programme, and single step editing of such recorded tapes takes three to five times more than the shooting time. In order to make post production system work more effectively, provisional editing is undertaken in this stage before tapes are sent to the post production. Three sets of editing

control unit will be provided so that the IET will be able to produce 100 pieces of programme of 30 minutes annually.

D) Post Production Studio:

Sophisticated editing of video/audio materials recorded in the studio and outdoors, or pre-edited in the editing room, will be undertaken. Special effects will also be added to the video and audio materials.

Major Equipment

VCR (1/2" Broadcast Standard)
Editor
Video Production Equipment
Audio Production Equipment
Monitoring Equipment
Rack Assembly

Functional Outline

- Basic function of this system is to conduct A/B roll editing by VCRs and editor centred around the digital video effect included in the video production equipment.

- In order to produce the final products of audio-visual aids, such equipment that are used for making title, superimposing, graphic animation, background music after-recording and announcement will be included in the video production and audio production equipment.

E) Outdoor Coverage Equipment:

The equipment is used for electric news gathering (ENG) outdoors and at the outside institutions.

Major Equipment

VCR in Camera
Audio Equipment
Monitoring Equipment

Portable Lighting Kit
Potable Dimmer
Outdoor Coverage Car

Functional Outline

- Camera will be of VCR-combined type used for outdoor shooting, and the video format will be the same with those for TV studio and post production studio, i.e. 1/2" broadcast standard.

- As to the portable lighting kit, battery operated type is useful for outdoor use. However, the battery itself is mostly made of nickel-cadmium which quickly deteriorate by memory effect (voltage fall caused by frequent charging without discharge) besides it is costly. Therefore, this lighting kit will be of AC operated type.

- Outdoor coverage car will be of wagon type with diesel engine, and rack assembly will be installed in the rear part so that both production crew and equipment are transported.

F) Measuring Equipment and Tools:

These are used for adjusting and maintaining of all the equipment.

Major Equipment
Measuring Equipment
Tools

Functional Outline

- Those measuring equipment, adjusting tools and jigs will be selected that are indispensable for keeping the conditions of the equipment operable so that the IET can produce educational programmes stably and uniformly.

G) Installation Materials:

These are essential for systems composition.

Major Items

Cables

Connectors

Assembly Members

Functional Outline

- Most of the planned equipment comprise systems. Therefore, the equipment needs to be installed, inter-connected and set up on the designated location as a part of each system. For this purpose, it is essential to include installation materials as part of the project component.

- Since the grade of video and audio signals are high due to broadcast standard, cables and connectors shall be of the quality actually applied in broadcasting.

H) Power Supply Equipment:

These are necessary for stable power supply to the equipment without creating any noise which affects the performance of production adversely.

Major Equipment

Distribution Board

Isolation Transformer

Automatic Voltage Regulator

Functional Outline

- It is impossible to prepare independent power supply of three phase directly from AIOU sub-station for studio lighting alone. Therefore, existing power supply in the IET building needs to be shared by the equipment and the lighting. In order to protect VCRs and other equipment from the noise created by the lighting, isolation transformers shall be installed.

- Voltage fluctuation in the IET building is estimated at $\pm 2.5\%$ or more of the rated figure. Therefore, automatic voltage regulators will be installed to cover all the equipment in the central apparatus room, post production studio and

radio studio except for monitoring equipment in order to avoid the possible trouble caused by such fluctuation.

I) Presentation Equipment:

This equipment is used for viewing and checking the produced audio-visual materials by the course team members or other academic and administrative staff of AIOU as to appropriateness and legitimacy of the programmes.

Major Equipment

Colour Video Projection
20-inch Colour Picture Monitor
40-inch Colour Picture Monitor
VHS VCR
Optical Presentation Panel
Electronic Print Board

Functional Outline

- Colour projectors and monitors will be provided for viewing produced audio-visual programmes.

- A presentation panel will be provided for presentation and checking of the scenario and graphic animation produced by the personal computers.

J) Electronic Field Production Car:

This system will be used for location of video shooting taking longer period, and wide-ranging gathering of materials outside of the IET.

Major Equipment

Colour Camera Chain
Video Production Equipment
Audio Production Equipment
VCR (1/2" Broadcast Standard)
Monitoring Equipment
Modified Vehicle

Functional Outline

- A modified vehicle mounted with necessary equipment will be used as a mobile studio with editing function so that it can produce audio-visual materials in such fields like natural science, agriculture, geography, history, etc. for which outdoor materials gathering is essential. This system will not include the function of outdoor relay telecasting by microwave etc.

- Cameras will be of VCR-combined portable type for ENG use. Other equipment will be consonant with the standard of studio equipment to keep the video grade uniformly.

K) Other Equipment for Educational Use:

These are supporting equipment for programme production, scenario writing, and other production activities.

Major Equipment

Test Run Tape
Microscope with Camera Attachment
Audio System for Auditorium
Conference System
Duplication Master
Microcamera
Script Processing Equipment

Functional Outline

- Test run tapes will be provided for use during the period for adjusting the system and instructing the IET personnel for operation and maintenance.

- A microscope with camera attachment will be provided for preparing materials of scientific experiments.

- A simple audio system will be installed in the auditorium to augment the audio system of colour video projection.

- Master VCRs will be connected to the present video dubbing system by interface in order to follow up the change of video format.

- A microcamera will be used for preparing enlarged video materials of small objects like plant seeds, microscopic organism, etc. The microcamera will be of simple type of single CCD due to low frequency of use only for peculiar purposes.

- Personal computers with word processing software will be provided to prepare scripts in Urdu and other local languages.

L) Radio/Dubbing Studio:

A series of audio recording and dubbing of radio programmes, audio tapes, video narration, etc. will be undertaken.

Major Equipment

Audio Mixer
Multitrack Tape Recorder
Compact Disk Reproducer
Tape Recorder/Reproducer
Disk Reproducer
Cassette Tape Recorder/Reproducer
Sync Lock System
Effecter
Monitor Speaker
Studio Monitor Speaker
Microphone and Stand
Announcer Cough Box
Announcer Desk
Headphone Box
Headphone
VHS VCR
14-inch Colour Picture Monitor
High Speed Duplicator

Functional Outline

- After this project is implemented, present radio studio-2 will be converted to the post production studio and, therefore, the IET will have only one radio studio. All the audio recording and processing of radio programmes, audio tapes for distance learning packages, narration for video tapes, etc. need to be undertaken in this studio alone. System components of this studio shall be as such that they should cover all such works. Audio effecter will be provided to prepare materials of music programmes to be used for national and traditional culture education.

- Radio programmes to be broadcast through PBC need to be of spool type, while those for distance learning package are of cassette type. Therefore, duplicators will be provided of both types to meet the demand.

M) Spare Parts:

These are essential for effective use of the equipment.

Functional Outline

- Spare parts and maintenance parts will be provided to cover two years period for normal operation of the planned equipment. Contents of these parts will be defined taking into consideration of the practical operating hours of the equipment needed to produce approx. 100 video programmes and 400 audio programmes.

2-3-5 Maintenance and Management Plan of the Equipment

The IET's pieces of equipment are to be maintained and controlled by the engineering section under the guidance of the chief engineer. In the case of the existing equipment, the senior engineer, TV engineers and associate engineers are controlling the equipment under their charge on a daily basis. The spare parts however are all stored in the technical store inside the IET building and the store keeper in charge is controlling the inventory. Also, for the actual repairs and maintenance, there is a separate engineering and maintenance room inside the building. The equipment to be introduced through this project will also be maintained through this maintenance and control system. As can also be seen

from the fact that the IET is continuing to use old equipment by maintaining them in good order, the IET engineers' maintenance and management ability is basically very high. Committing the maintenance and repair of the equipment to their original manufacturers or their authorised dealers after the term of guarantee has expired will be very costly so that also from the viewpoint of maintenance and control expenses, it is desirable to utilise the present maintenance and control system of the IET. However, since the equipment under this project includes the ones of new technology, training of IET engineers and technicians by the equipment manufacturers on maintenance and repairs methods is believed necessary when introducing the equipment.

This project will make available spare parts enough to cover two years operation under normal conditions after introducing the equipment. These include such things as VCR drum heads which must be replaced after the prescribed period of operation and those such as print circuit boards which should be made available in case of breakdown. While it cannot be said that the IET will use up all these spare parts during the two years, it will require a spare parts cost worth around 5 million yen a year from the third year on the assumption that the IET will use them up. This however is only 0.7% of the AIOU's total expenditure during the latest fiscal year so that in this respect also, it is believed that there will be no financial problems.

As for the equipment themselves, by taking account of the general depreciation period and frequency of use, it is believed necessary to think of renewing them in 10 to 15 years after introduction.

2-3-6 Environmental Problems

There are no adverse effects on the surrounding environment likely to be caused by this project.

This project includes two vehicles for uses such as outdoor materials gathering and production hence there is the problem of emission of exhaust gas so that it cannot be said that there is no influence. However, when consideration is given to the present state of the automotive technology, alternatives such as to introduce electric automobiles are not realistic. Also, by giving consideration to the automobile's social significance and the quantity of two, it has been judged that the environmental impact is within the scope which can be disregarded.

2-4 Technical Cooperation

2-4-1 Necessity for Technical Cooperation

In this project, initially there was no request from the Pakistan side for technical cooperation. The official request in the form of PC-1 had requested for on-the-spot training related with the supplied equipment and systems mainly at facilities of foreign manufacturers within the framework of grant aid. While the IET technical staff are capable, compared with the old equipment they have used for over 15 years, the items of equipment to be provided through this project have introduced new technologies so that updating of the technical capacity of the personnel in charge in the areas of the equipment operation, maintenance and control and programmes production technology is believed indispensable.

On the other hand, the training items related with the studio are very diverse. From the viewpoint of how to have the Pakistan side effectively utilise the equipment introduced through the grant aid, it is desirable to carry out the following training at manufacturers facilities.

a) Software (studio operation): 1 person for 3 months
b) Hardware in general (equipment maintenance and control): 1 person for 3 months

2-4-2 Cooperation with Other Donors

Section 1-3-1 has shown the record of the assistance provided to the AIOU by foreign donors. Through past assistance of the ODA of the UK which has been the main donor, technical training of from six weeks to around three months have been provided to nine IET staff since 1977. The staff who received this training were mainly producers and designers and only one engineer was included from the engineering section. Also, in terms of provision of equipment to the IET, provided in addition to the radio studio equipment from the outset of establishment have included video dubbing machines, audio cassette dubbing machines and U-Matic VCRs.

These contents of assistance have mainly concerned training for maintenance and control and production technology related with the IET's existing equipment and are basically different from the new technology and equipment covered by this project and the production

technology they will bring about. However, part of these personnel and equipment will be used along with the equipment to be provided through this project and comprise personnel related with their operation and maintenance. They hence have important meaning for this project also. From such a viewpoint, cooperation with the British Council which is the management agency of the British ODA projects is believed indispensable for this project's effective execution.

CHAPTER 3 BASIC DESIGN

Chapter 3 Basic Design

3-1 Concept and Policy for Basic Design

3-1-1 Framework of Cooperation Project

The IET comprises an independent production studio specialising in the production of educational programmes. Although there are fluctuations over the years, it is producing around 50 video and 100 audio educational programmes a year using its existing equipment. The programmes are being broadcast one hour (2 programmes) every day through ETV in the case of video aids and 15 to 45 minutes (1 to 3 programmes) a day through the PBC in the case of audio aids.

Among the educational programmes to be produced by the equipment to be provided through this project, the video programmes will be broadcast by ETV. ETV however has already developed mainly broadcasting equipment through Japanese grant aid. Therefore, the contents of the present project have been conceived based on the following assumptions.

- To avoid duplication with the contents of the cooperation provided to ETV, equipment whose main objective is to transmit broadcasting signals will not be covered by the project;

- Equipment which require enlargement of the IET's existing building or new construction will not be covered by the project;

- Equipment whose installation requires substantial improvement works will not be covered by the project.

3-1-2 Design Policy

The IET is an independent production studio specialising in the production of educational programmes. The video teaching aids to be produced using the equipment s to be introduced through this project are planned to be broadcast by ETV. However, the VCRs now being used at the IET are of the 3/4" U-Matic low-band format which involves great generation loss at the time of editing and dubbing and today it is accounted inappropriate for televising purposes. Moreover, there have occurred problems such as that the cost of the 3/4" tapes is high compared to prevalent 1/2" tapes, which has been increasing the studio's running

cost. For this reason, through this project, it will be necessary to replace the present U-Matic VCRs with the 1/2" component type VCRs which are now the main current globally and ensure the quality of images on the broadcasting level. Therefore, by taking account of the project's basic concept, objectives and targets mentioned above, this project should set up the following design policies.

- Match the technical level of the overall system of the equipment to be provided with that of the Pakistan's broadcasting stations;

- The video materials should be based on the broadcasting technology standards of the CCIR with a scan rate of 625/50Hz;

- The television standard should be the PAL-B standard;

- The VCRs should be the high cost-performance 1/2" type for broadcasting operations;

- The equipment should be examined by placing the emphasis on the structure as a system. The work items common to the systems should be unified to enable efficient operation;

- Except for the outdoor coverage car and field production car, the equipment should all be of the quantity and scale that they can be installed in the present IET building;

- As for suppliers, the manufacturing country desirable in the area of equipment performance should be selected by taking account of each system's equipment characteristics. Also, those which had better be locally procured for reasons of availability and operation and maintenance, etc. should be locally procured;

- The technical personnel of the executing agency should be provided with training opportunities for acquiring the new technology to be brought about through introduction of the new equipment.