

# **Appropriateness of Curricula, Technology Choice and Methods of Assessment: A Study of Vocational Education Programmes in Agriculture through Distance Mode**

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## **ABSTRACT**

The School of Agriculture and Rural Development of Bangladesh Open University, Bangladesh has been launched three formal programmes in agricultural sciences viz. Bachelor of Agricultural Education, Certificate in Livestock and Poultry and Certificate in Pisciculture and Fish Processing since 1997/1999. The school follows strict regulations during development of curriculum-based modular printed course books, radio and TV programs, enrolment, tutoring and assessment of the students. The aim of this study was to evaluate the suitability of curricula, media of delivery and methods of assessment of these programmes being effectively delivered in open and distance learning system. The structured questionnaires were administered on significant number of students in each programme in face-to-face situation and focus group discussions were also carried out with tutors. A number of dropouts, successful students and experts were also interviewed. It revealed that current curricula, course materials, delivery systems and assessment methods are effective and appropriate for the theoretical knowledge but inadequate for teaching practical skills in agricultural sciences. Based on opinions from students and tutors, innovative approaches, such as revision of curricula, supply of audio-visual materials to the tutorial centers, increase facilities for practical sessions, introduce asynchronous electronic technologies (internet, e-mail and mobile phone) for rapid dissemination of information on admission, tutorial session and examination are suggested. The present paper discusses in detail the appropriateness of curricula, adopted technologies, methods of assessment and problems encountered with probable suggestions regarding agricultural education in a distance in Bangladesh.

**Keywords:** Curriculum development, vocational education, agriculture, distance mode, appropriate technology.

## **INTRODUCTION**

With 150.45 million crowded into an area of 147,570 sq km, Bangladesh is a developing country (GDP growth rate 6%) with highest population density in the world (CIA Factbook, 2008). Although contribution of agriculture sector to GDP is not very high (23.5%), however, nearly two-thirds of working population is now employed in agricultural sector. About half of her population are living under the poverty line. Among the total population, around 40 millions are estimated to

be within the age group of 15–30 years, which are considered as youth. Therefore, if this vast population of youth can be utilized in the right direction, they can be instrumental in overall development of the whole country. Technical and vocational education is considered one of the important means for poverty alleviation, self-employment and overall economic development of any developing nation.

It has been found that after passing Higher Secondary Certificate, only four percent students pursue higher education in Bangladesh as the public and private universities combined do not have adequate seats to accommodate them (Anonymous 2007). A major part of these youths are unemployed. Vocational and technical education provides employment-oriented knowledge and skills to the unemployed youth force. However, current strength of conventional institutions satisfies only a few portions of the huge demand for such kind of education and training. Besides, people of all ages, and diverse locations cannot be trained up through the conventional system and demands for easy accessible alternative like open and distance learning. Considering these facts, the School of Agriculture and Rural Development (SARD) of Bangladesh Open University (BOU) has been launched three academic programs namely, Bachelor of Agricultural Education (B.Ag.Ed.), Certificate in Livestock and Poultry (CLP) and Certificate in Pisciculture and Fish Processing (CPFP) through distance mode. These programmes have been designed to provide essential know how, skills and professional knowledge especially for young people interested to generate self-employment through crop, fisheries, livestock and poultry farming as well as to participate in technology transferring activities through government and non-government organizations.

Now distance education is defined as learners being able to communicate with voice, video and data, real time with teacher and other learners using modern information and communication technologies (Islam and Selim, 2006). However, it has been a concern of educators to effectively deliver laboratory-based science courses through distance mode (Ross and Scanlon, 1995; Kennepohl, 2007). For pedagogic delivery, BOU uses both the conventional face-to-face tutorial system based on the print module and electronic technologies such as radio, and TV broadcasts. In several studies, it has been found that BOU education is flexible, cost-effective and in comparable standard that of the conventional universities (Islam et al., 2006). However, skepticism is remained whether current curricula, delivery and evaluation methods are enough to impart knowledge and practical skills to students attending courses in agricultural sciences those have substantial practical works (Islam, 2008). No research has been carried out to find out real problems and means for their solution so far. Therefore, the aim of this study was to evaluate the appropriateness of curricula, technology and methods of assessment for three academic programs in agricultural sciences by analyzing opinions from students, tutors, and experts.

## METHODOLOGY

To reach education to the door steps of people, BOU has set up 12 regional centers (RCs), 80 coordinating offices (COs) and more than a dozen of tutorial centers (TCs) geographically distributed throughout the country (Fig. 1). This report includes the results of one new recent survey on B.Ag.Ed. program along with two previously conducted case studies on CLP and CPFP programmes (Rahman et al., 2005; Shah et al., 2005). A brief description of these academic programmes and year-wise student enrollment are given in Table 1 and Fig. 2. To understand the appropriateness of the curricula, technology choice and methods of assessment in different programmes, the samples of these case studies were included current students, dropout and successful students, tutors, and experts.

Structured questionnaires were prepared and used as described previously (Rahman et al., 2005). Questionnaires (100 for B.Ag.Ed., 37 for CLP and 27 for CPFP) were provided to the students and collected in different TCs of the respective programmes. A small number (5-10 in each

programme) of dropout students were directly interviewed. Besides, a number of employers and successful past students were also interviewed at their offices or farms. Focus group discussions were carried out with tutors in all the TCs. All data were analyzed using MS Excel software.

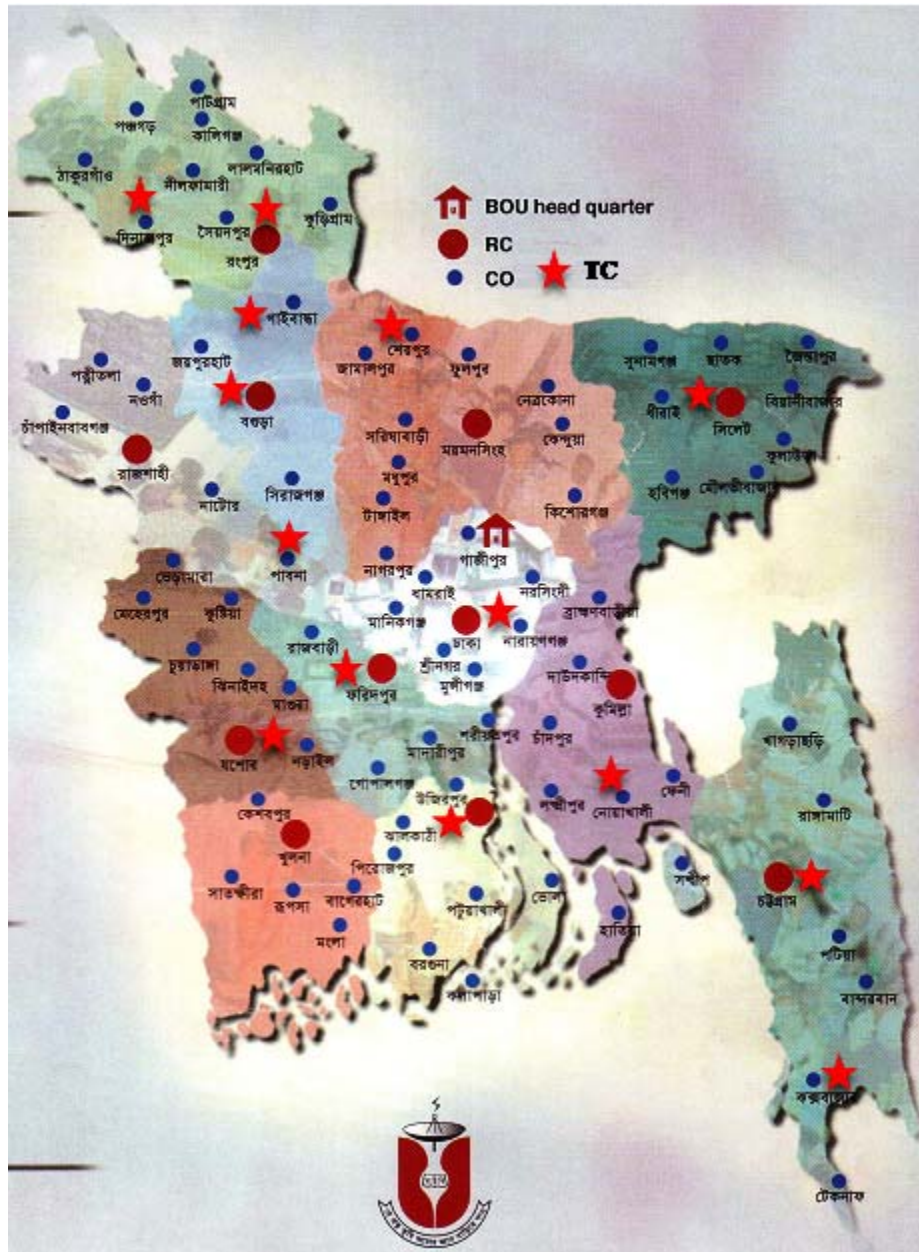


Fig. 1. Locations of BOU's main campus, regional centers (RC), coordinating offices (COs), and tutorial centers (TCs) of SARD in Bangladesh. Source: PPDD, BOU.

Table 1. Information on admission, duration of completion, credits, delivery and evaluation methods of studied programmes.

Name of program	Year of launching	Minimum admission requirements	Minimum/maximum duration (months)	Number of Semesters (total credits)	Delivery method	Assessment/evaluation
Bachelor of Agricultural Education (B.Ag.Ed)	1997	HSC (Sci./Agric.) or, Dip.Ag. with min. 2 <sup>nd</sup> class	36/72	06 (95)	Print, radio, TV and face to face tutorial session	TMA and semester-end examination
Certificate in Livestock and Poultry (CLP)	1999	SSC	06/30	01 (16)	Print, TV and face to face tutorial session	TMA and semester-end examination
Certificate in Pisciculture and Fish Processing (CPFP)	1999	SSC	06/30	01 (15)	Print, TV and face to face tutorial session	TMA and semester-end examination

SSC, Secondary School Certificate; HSC, Higher Secondary School Certificate; TMA, tutor marked assignment; TV, television; Sci., science; Agric., agriculture; Dip.Ag., Diploma in Agriculture.

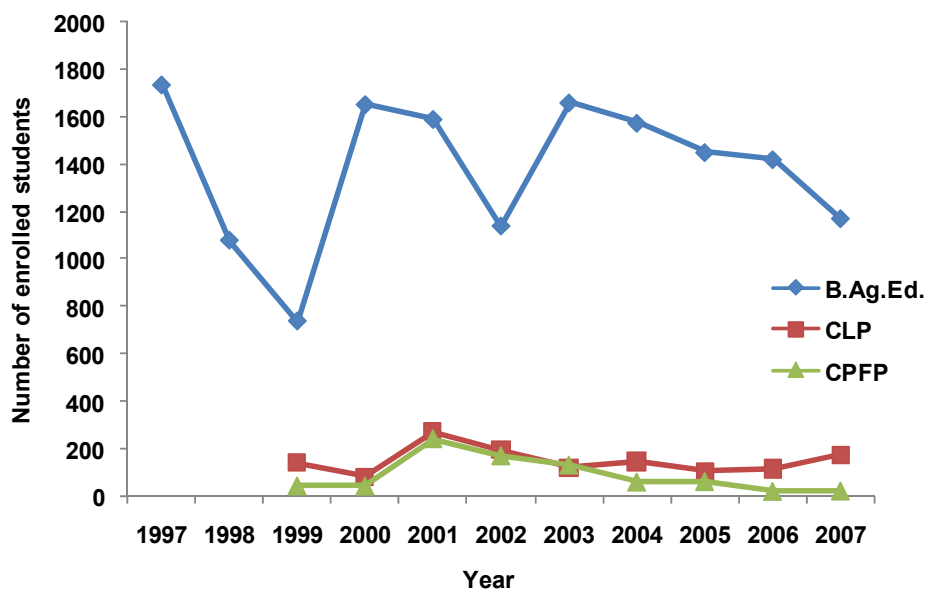


Fig. 2. Year-wise student enrollment in vocational education programmes in agriculture.

## RESULTS AND DISCUSSIONS

### Curriculum and Course Materials

BOU has launched CLP and CPFP programmes based on the results of a national need assessment survey. When Government of Bangladesh introduced agriculture as a compulsory subject in all classes (6-10) in nearly 300 thousand secondary school and madrashas (religious school) in 1992-1993, SARD of BOU took the challenge to produce graduate teachers by launching a unique program B.Ag.Ed. which included courses from crops, animal, fisheries, social and pedagogical sciences. In each programme, there is a curriculum committee consisting of leading academicians and media experts from the in-house faculties as well as from outside the BOU who design detailed curriculum. For each individual course, there was a syllabus committee to frame the detailed syllabus following the content of curriculum. When the curriculum was finally approved by the Academic Council, the course materials were prepared by a course team comprising subject specialist, editor, style editor, graphic designer, and media specialist. All course materials were peer-reviewed by two anonymous referees before printing (Fig. 3). The lesson containing the practical or laboratory works is designed in step by step process with enough illustrations, drawings and examples so that students can do exercise at their home environment and/or nearby farm/field. The practical/labwork related lessons are added consistently together with theoretical lessons within the printed course books of the respective courses. Almost similar strict principles are followed in audio and audio-visual production (Islam, 2008)

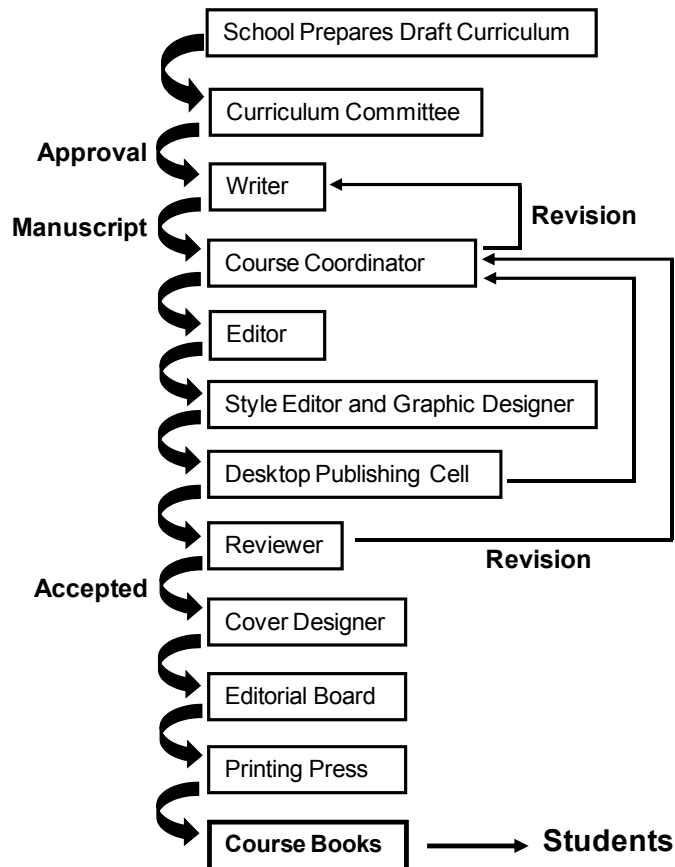


Fig. 3. Schematic diagram of the processes of course book production (Islam et al., 2006).

Students' opinion revealed that the contents and overall quality of the printed course books were good to very good irrespective of the programmes. However, most of the students opined that the volumes and number of courses were too much for each semester. The quality of BOU curricula were also found comparable standard to curricula in formal systems (Islam et al., 2006).

### Students' Profile

It is important to know the socio-economic status, and other background information of the students for taking policy decision regarding delivery media of any distance learning program. Percentage of students enrolled in B.Ag.Ed., CLP and CPFPP programmes from rural or urban areas, male or female, and different age categories are presented in Table 2. Higher number of students from the rural areas enrolled in both B.Ag.Ed. (78%) and CLP (89%) than those of urban areas. However, in CPFPP program, the difference between rural (52%) and urban (48%) students were not differed much. Students' profile revealed that most of the enrolled students were rural (52-89%) youth (68-89%) of either sex who were employed or self-employed. Rate of female students enrolment in agricultural programs are very less probably due to various physical, social and circumstantial constraints (Rahman et al., 2005).

Table 2. Geographic origin, gender and age-related data of enrolled students

Program	Geographic origin of students		Gender		Age categories (years)				
	Rural	Urban	Male	Female	<20	21-30	31-40	41-50	>50
B.Ag.Ed.	78	22	87	13	1	89	10	NS	NS
CLP	89	11	97	3	8	68	16	5	3
CPFPP	52	48	85	15	19	67	11	3	0

NS, not studied.

Majority of the students of B.Ag.Ed. programme came from unemployed or current student of other conventional institutes (Fig. 4). Most of the students (60-75%) were motivated to enrol as the prospect of getting teaching job is high. Almost similar results were obtained in the cases of CLP and CPFPP programmes. In B.Ag.Ed. programme, highest number of enrolled students had HSC (81%) followed by Dip. Ag. (14%) and Bachelor (6%) (Fig. 4). Due to scarcity of seats in the conventional universities, higher proportion of enrolled students were with HSC (Anonymous 2007). Holders of Dip.Ag. might found B.Ag.Ed. programme as only way to go for higher studies or to get promotion those who have already employed in High School and Madrashes as the teachers. Although, minimum requirement for CLP and CPFPP is SCC, a few students had HSC or even a Bachelor degree (data not shown).

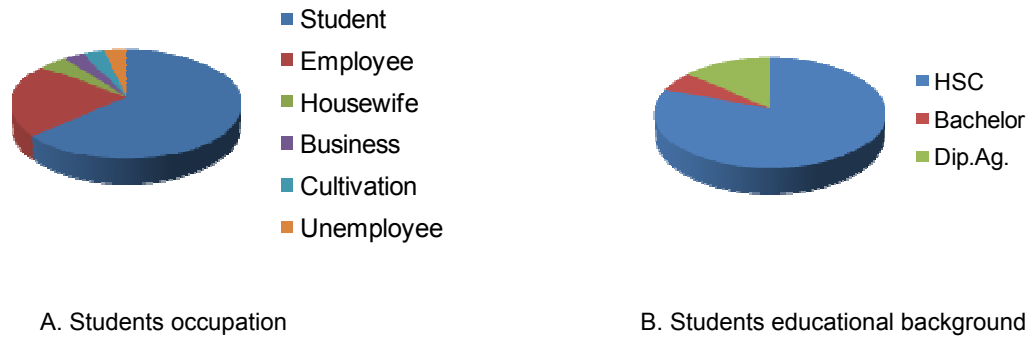


Fig. 4. Current occupations and educational background of students of B.Ag.Ed. programme.

### Appropriateness of Technology Choice and Efficiency of Delivery

#### *Choice of technology*

Students and tutors were asked about their access and choice of media for imparting knowledge and skills in their studied program. About 72-88% students' opinion were in favour of printed course book in combination with face to face tutorial service as their best choice of media. A fraction of students (10-17%) also chose TV and video cassette and only 8-12% chose cell phone with print and tutorial services. Very few students (only ~2%) thought e-mail/web-based instruction with print and tutorial service as their preferred medium of instructions. Survey results of B.Ag.Ed., CLP and CPFP programmes revealed that current choice of media are reasonable considering the socio-economic conditions of the students.

#### *Efficiency of learning materials*

Overall opinions from students revealed that current media of delivery is more or less appropriate for imparting knowledge and skills in agricultural subjects (Table 3). Irrespective of programmes, maximum number of students rated printed course books as very good followed by good and excellent. They did not face any problems regarding language, context and culture as the course books were written in *Bangla* and all of them came having almost similar cultural background. In case of TV and radio programmes, large number of students did not responded. Face to face interview with students revealed that students did not know the exact schedule of broadcasting and topic of the programme and thus had not listened to radio or watched TV. Those who listened radio or watched TV programmes, they rated as good followed by excellent and very good. Similar opinions were obtained from the tutors. There are several other reasons behind less effectiveness TV programmes such as failure of electricity, uncertainty of broadcasting time etc. (Islam et al., 2006; Islam, 2008).

Maximum students (52%) of B.Ag.Ed. programmes rated tutorial sessions are effective for gaining skills in practical lessons. However, they opined that current facilities and duration for practical classes were inadequate (Fig. 5). Similar opinion was received from the tutors irrespective of the programmes. They argued that student should visit commercial and research farms and learn delicate techniques by doing practical work. But current financial support from BOU is very limited. Almost all tutors suggested that attendance in practical session should be mandatory. However, a big difference was observed in conception and philosophy of distance education among the tutors. Some of them conduct tutorial session just like instructions given in traditional classroom.

Table 3. Students satisfaction on appropriateness of learning materials and media.

Program	Learning materials/services	Students opinion on quality of materials/services				
		Excellent	Very good	Good	Poor	No response
B.Ag.Ed.	Printed coursebook	25	51	24	0	0
	Radio/TV programm	17	43	40	0	0
	Tutorial services	52	22	25	1	0
CLP	Printed coursebook	35	51	14	NS	NS
	Radio/TV programm	22	11	5	NS	62
	Tutorial services	NS	NS	NS	NS	NS
CPFP	Printed coursebook	19	45	37	NS	0
	Radio/TV programm	19	11	37	NS	33
	Tutorial services	NS	NS	NS	NS	NS

NS, not studied

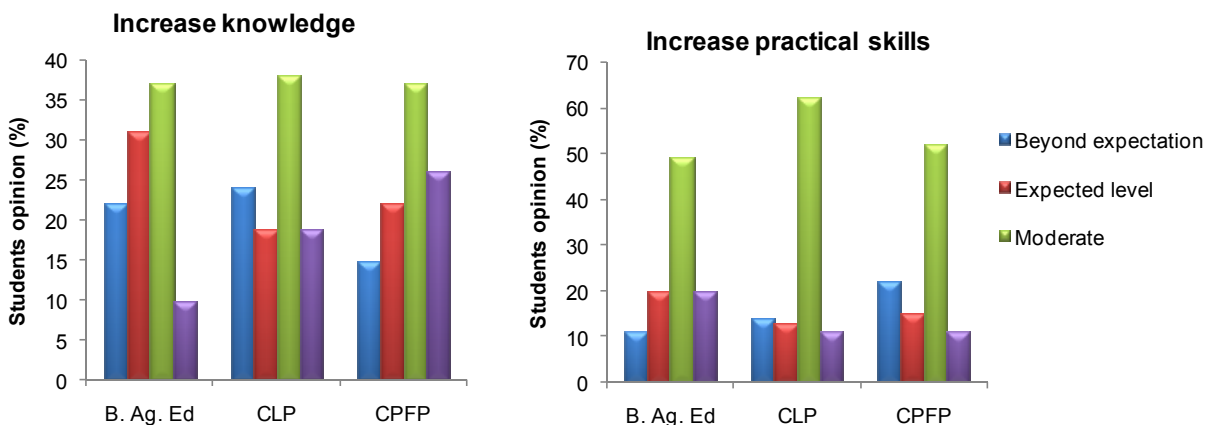


Fig. 5. Students' opinion on increment of overall knowledge and practical skills by current delivery methods.

### Appropriateness of Evaluation Method

To assess acquired knowledge and skills of the students, an appropriate evaluation method is needed. SARD introduced two types of evaluation for assessing students' performance. One is tutor marked assignment (TMA), a tool for continuous evaluation, and the other is semester-end examination. Each course is evaluated in (total) 100 marks. The marks distribution for TMAs, theory and practical sections are 10, 70, and 20, respectively. Students have to get minimum 50% of marks in each section to complete a course. Results are expressed in cumulative grade point average in scale 5 (Islam and Selim, 2006).



Interview with students, tutors and experts revealed that this strict and non-flexible evaluation system is generally accepted by all sections for maintaining quality assurance. Students were asked, “whether or not TMA is a continuous process of students’ performance assessment”? Irrespective of the programme, most of them replied ‘yes’ (90-100%). Delay in processing and publishing examination results were serious concerns in all students. It is identified as one of the reasons for delay of completion or failure or high dropout rate (Numan et al., 2007).

### Current Problems and Suggestions for Improvement

Effective transfer of knowledge and skills in agricultural sciences in distance mode is no doubt a big challenge in any developing country (Islam 2008). BOU exploits national, regional and local infrastructures, facilities and experts during week-ends and holidays for their students and thus education in BOU is cost-effective (Islam and Selim, 2006). Based on the opinions of survey, interviews and workshops with students, tutors, coordinators and faculties, some major problems in current practices and their possible solutions are summarized below.

Problem area	Problems	Suggested solutions
Print	All course books are also not up to date and revised. Some of the practical lessons are difficult to follow.	Appropriate solution is to revise books in every two years and prepare practical lessons in a step by step process with appropriate photographs, artworks and examples.
Audio and audio- visual	The number of radio and TV programmes in each course is inadequate. Students do not know exact schedule and topic of broadcasting.	A topic-wise schedule of radio and TV programmes should be sent to the students. Audio and audio-visual programs should be available in the RCs, TCs and even COs for the students use. Some programmes could be added to the course-package as CD-ROM.
Tutorial service	Facilities for hands on practical works in the TCs are limited. Attendance in tutorial sessions is poor. No library facilities for the students in the TCs. Many tutors have not received any training.	Facilities for practical works and field/farm visits should be increased. Students’ participation in the practical session could be encouraged by allocating 10-20% marks for attendance. Library and internet facilities for students in the TCs/RCs are needed to be introduced. A study should be carried out on how cell phones can be used as a mobile learning tool as most of the students and tutors have access to this technology. A Tutors Guide Book describing the role of tutors should be provided to each tutor.
Evaluation	Processing examinations and publishing results take 4-8 months.	BOU should find way to complete evaluation process of examination and publish results within 3 months. As already practice in conventional system, the results of examination should be published in website and let students know through automated SMS by mobile phones.

## CONCLUSION

This study investigated the suitability of current curricula, delivery media and methods of evaluation through survey and interviews of the students, tutors and experts involved in three programmes in agricultural sciences of SARD. Generally the curricula, choice of media of delivery and methods for assessment were found acceptable in current socio-economic context of Bangladesh but there are ample scopes for further improvement. This study identified a number of bottlenecks in current practices and suggested ways for their solutions. The results of this study should have important practical implications in policy decision and further research.

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