The changing face of post-grad education in aquaculture: contributing to soaring production and sustainable practices

David C. Little, Andrew P. Shinn and Corinne Critchlow Watton
Insitute of Aquaculture,University of Stirling, Stirling, FK9 4LA (dcl1@stir.ac.uk; aps1@stir.ac.uk; cac3@stir.ac.uk)

The range and type of post-graduate education and training available in Asia and further afield continues to develop and increase to meet the needs of the sector. As the production and value of aquaculture has soared over the last two decades new opportunities to gain the right qualification has become ever more important to open the right door and, in time, the career of choice. Typical profiles and expectations of students have changed significantly over this period as has the range of study options. Twenty years ago the overwhelming proportion of MSc students enrolled on programmes at AIT, Stirling or Auburn, who were major established providers at the time, were government officers typically supported by overseas development assistance. Increasingly, applicants work for non-government and the commercial sector or have aspirations to do so. The growing diversity of employment also means that the type of skills required in graduates is changing. Many employers now require new recruits to have a broad range of problem solving skills in addition to technical knowledge including capacities for management, information handling and communication. Understanding of how institutions function and the social and economic implications of aquatic resource management are now considered mainstream skills. On the other hand specialised skills are also increasingly required in fish health, genetics, environmental management and nutrition as production systems become more technology driven.

The old adage that the qualification allows the learning to begin 'on the job' is less acceptable as employers seek to recruit those best prepared for specific roles and this has led to increasing demand for graduates with employment experience. Rapid changes in aquaculture practice have also led to an urgent need for upgrading/retraining of those already within the sector and related sectors.

These trends occur at a time when the separation of study and employment is becoming less practical due mainly to the high costs of full-time dedicated study. Not only are programmes increasingly expensive but loss of earnings and career opportunities need to be considered, quite apart from consequences for family life.

Engagement in a work situation in parallel to study can also make learning more effective as the application of knowledge within work situations can help to deepen the learning process. There are several approaches to this including making post-graduate education more flexible and managed around work as short intensive modules, using internships as part of full-time study options and part-time distance learning whilst remaining in employment.

Flexible study options are becoming increasingly popular with employers who may wish to support staff development without losing key employees for long periods of time. 'Sandwich' courses are not new but there is a trend towards modularising programmes, thus making them more flexible, among aquaculture programme providers such as the Asian Institute of Technology[1] and University of Stirling[2]. This flexibility can be particularly important to employers with limited numbers of employees; loss of a key member of staff for prolonged periods of time to overseas study can have significant costs and extended periods of time spent away tend to mean longer periods for readjustment and return to normality on their return. Ideally, shorter periods of study are less disruptive to work and family life.

Credit sharing is also a trend that should allow greater mobility of students but is dependent on harmonisation of programme structures and assessment. Universities such as Ghent and Wageningen have long shared credit but now a larger range of institutions are involved through various EU programmes encouraging such trends. Patrick Sorgeloos[3] from Ghent is working to extend these arrangements to Vietnam and allowing more flexible study between Belgium and Vietnam to the benefit of students registered for study in both countries. The rapid growth of aquaculture in Asia has encouraged interest among Europeans in studying in the region. Ad hoc placement for research projects and study tours have become established features of European programmes but these are now developing into more formalised internship arrangements such as that supported under the EC-funded Asia Link programme[4] between AIT, Universities in Vietnam, Cambodia and Nepal and Stirling, UK and Alveiro in Portugal. This programme includes opportunities for both Asian and European students to engage in placements with private and public sector partners. Ideally such internships provide benefits to both parties, with the student or new graduate gaining work experience and opportunities for mentoring from professionals and the employer gets the enthusiasm, energy and fresh ideas of working with an individual beginning their career. Other benefits include those associated with cultural exchange and friendships that form with such short-term but intensive internships. Mutual benefit is the key feature of internships and their design and the management of participants and local mentors is taking various forms to ensure this. Nick Innes-Taylor[5] of Wetland Alliance, a SIDA-funded programme working in SE Asia, insists that potential interns develop work programmes based on problems identified by the local host organisations. A short accessible report of the intern's key findings is a required output before leaving the site.

An innovative approach to combining postgraduate training and employment is on-going in Bangladesh where Stirling and the Bangladesh Agricultural University are delivering a blended distance learning programme in Aquatic Resource Development to over 60 students living and working throughout the country. Funded by the Common-

wealth Scholarships Commission, the programme allows people to study while working, primarily targeting students for whom a conventional face-to-face course, locally or overseas, is not an option. Studying at distance has its own challenges and students need high levels of motivation to complete the certificate (yr 1), diploma (yr 2) and full masters (yr 3). The programme is designed around successive modules over the first two years followed by a project year based on a part-time commitment of 10-15 hours/week. Regular contact with local tutors by mobile phone and with UK-based tutors through the internet helps to support students self-learning. Continuous assessment of participation in discussion boards and electronically submitted assignments are key features of the programme. The relationship with the workplace is critical; potential participants require letters of support from their employers and the project year is designed around an issue identified by the student and his/her employer.

The education and training session of the WAS meeting at Busan, Korea will be reflecting on the changing face of education with representatives from Asia, Australia and Europe. Flexible learning, the role of internships and combining work with study through Distance Learning will be featured.

Contacts

1. Amararatne Yakipitiyage (amara@ait.ac.th).
2. Trevor Telfer (tct1@stir.ac.uk).
3. Patrick Sorgeloos (patrick.sorgeloos@ugent.be).
4. Corinne Critchlow-Watton (cac3@stir.ac.uk).
5. Nick Innes-Taylor (nickIT@ait.sc.th).

Hatchery management in Bangladesh

***Abdus Salam Bhiyan, A. S. M. Musa and M. K. Islam**
Department of Zoology, University of Rajshahi, Rajshahi-6205, Bangladesh

To meet the increasing demand for animal protein in Bangladesh, adoption of intensive and extensive culture practices on certain selective species of fishes is very important. Induced spawning has opened the door of new era in the production of fish throughout the world.

For intensive and extensive fish culture it is necessary to ensure the supply of suitable sized good quality fish seed in sufficient quantities. The main source fish seeds in Bangladesh are spawn produced in government and private hatcheries, and some collected from rivers.

The seed collected from natural breeding grounds have many problems such as the inclusion of seed of predatory fishes or disease. Wild seed is collected and handled in crude and unscientific methods that can potentially lead to large scale mortality during transportation from collection centres to nursery ponds and also in the nursery ponds after release. Therefore, emphasis should be placed on expansion of hatchery facilities to supply high-quality fish seed required to support aquaculture development.

For proper planning, management and sustainable development of hatcheries it is necessary to identify the specific problems and requirements of an area. We conducted a survey to collect information on hatchery management that we hope will be helpful to fish culturists, farm managers, production specialists, policy makers and extension workers. The results of the present study will also provide valuable information to researchers who are interested to conduct similar type of study in future.

Materials and methods

Production season of fish seed generally starts in March and ends by late August every year. However the survey for collection of data was conducted during March to September. The study area was Kotwali Thana under Jessor district. Data was collected by direct interviews with individual respondents. Questions were asked systematically in a very simple manner with explanation wherever it was felt necessary and the information recorded.

Results and observations

Establishment of hatcheries

The establishment year of the surveyed hatcheries ranged from 1981 to 1985. The maximum hatcheries in the surveyed area were established in 986-91. Table 1 shows the year of establishment of the hatcheries in the studied areas.

Occupation of the hatchery owners

On the basis of occupation the hatchery owners have been divided into two types. The first type is hatchery business only and the other type is hatchery business and others. Among the surveyed 21 hatcheries owners, nine earn their livelihood from only the hatchery business and 12 had other business interests such as service, agriculture etc.

Educational status

The educational status of hatchery owners of the surveyed areas are presented in table 3. Out of 21 private hatcheries owners 9.52% were illiterate but had the ability of signature. About 14.29% and 23.81% of hatchery owners had primary and high school education respectively. 23.81% and 19.02% hatchery owners had SSC and HSC level education respectively. Only 9.52% owners had graduation level education.