

A UNESCO AGENCY OFFERS PROFESSIONAL DEVELOPMENT ACROSS GEOGRAPHICAL AND GENERATIONAL BORDERS

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ABSTRACT

UNESCO's Intergovernmental Oceanographic Commission and its International Oceanographic Data and Information Exchange programme are using training, networking, and online learning resources to develop skills and leadership among marine science information staff of varying ages and backgrounds internationally. The paper employs the framework of IFLA's Continuing Professional Development and Workplace Learning Section's guidelines, "Continuing Professional Development: Principles and Best Practices," to check the extent to which this UNESCO/IOC programme reflects the IFLA Section's quality continuing education guidelines. In addition, UNESCO/IOC's effort to foster professional development and retention of marine science information professionals working in decentralized and widely dispersed locations is considered in reference to the themes of the Section's 2009 satellite conference in Bologna.

INTRODUCTION

How can intergovernmental organizations contribute to the development of libraries and information centers and their personnel, even where there is no hierarchical relation between them and each participating national organization? This paper looks at the efforts made by the Intergovernmental Oceanographic Commission of UNESCO (IOC), specifically its International Oceanographic Data and Information Exchange (IODE) programme. The objective of the IODE programme is to stimulate the management and exchange of data and information on a regional and international scale in the subject domain of marine/ocean science and oceanography. As an important component in the programme, marine science information managers (librarians) are offered opportunities and products for continuing professional development. The information professionals involved can be quite young or very experienced. Their backgrounds can be study and/or experience in information management, in ICT applications, or in marine science. The combination in

one information manager of skills in all these domains is of course desirable but not realistic.

BACKGROUND

The IOC's International Oceanographic Data and Information Exchange (IODE) was established in 1961 to enhance marine research by facilitating the exchange of oceanographic data and information between participating member states and by meeting the needs of users for data and information products. Whereas IODE focused initially only on oceanographic data, the IOC decided in 1987 to add marine information management to the terms of reference. During the past 49 years, IOC member states have established 80 oceanographic data centers. In addition, a network of national coordinators for marine information management has been created. Established in 2005, the IOC Project Office for IODE, based in Oostende, Belgium carries out activities in order to:

- develop, strengthen and maintain IOC/IODE ocean data and information management training programs and training tools;
- provide an environment ('think tank') where ocean data and information experts and students can work, meet and discuss;
- develop, host and maintain IOC/IODE's ocean information systems and related public awareness tools;
- promote collaboration between all expert levels active in ocean data and information management, including scientists, data managers, other IOC (and JCOMM or WMO) programs and projects and other users;
- provide a laboratory environment for the development and beta testing of ocean data and information management technology.

More information is available from <http://www.iode.org/>.

Information management in IOC/IODE

Marine science libraries have an important role in promoting information about the marine environment: information provision to the policy makers – educating the next generation of environmental stewards; attracting a future environmentally concerned workforce and generating an ocean literate public that understands the value of the ocean and can make appropriate decisions to protect it. At the research level, the practice of publishing one's research progress in peer reviewed journals, thereby sharing the newly acquired expertise with others is and has been for centuries, the basis of scientific progress. Libraries have been the caretakers and managers of this printed knowledge. On an international scale, networks of libraries and information centers have provided access to ever wider collections of information including the so-called "grey" literature. Today's users of marine in-

formation include research scientists, policy makers, students at all levels, educators, industry and businesses. Marine information management centers interact with marine data managers to deliver information products, e.g. data that has been processed and interpreted.

IODE capacity building: The Ocean Data and Information Networks strategy

During the late 1990s IODE designed a new way to assist with the development of capacity. This new “strategy” is based upon these four elements:

1. providing equipment;
2. providing training;
3. providing seed funding for operational activities of newly created data centres and marine libraries; and
4. work in a regional context, addressing common (regional) as well as individual (national) goals.

This new strategy has been implemented as “Ocean Data and Information Networks” or ODINs. The first region where the new strategy was tested was Africa (see <http://www.odinafrica.org>). Later similar networks were created in the Caribbean/Latin America (<http://www.odincarsa.net>), European countries in economic transition (<http://www.iode.org/odinecet>), Indian Ocean region, Western Pacific region, Black Sea region, the Pacific Islands.

In terms of marine information management, the ODINs have focused on providing access to international research literature, creating the Open Science Directory, developing and sharing holdings databases of participating libraries, and sharing resources between participating libraries.

An important service of the ODIN projects has been the creation of human as well as institutional networks that make it possible to easily and informally share library resources, such as inter-library loan, sharing expertise by mailing lists, etc. ODINs have also sponsored membership in professional librarian organizations such as the International Association of Aquatic and Marine Science Libraries and Information Centers (<http://www.iamslc.org>).

An evolution related to resource sharing in recent years is the technology allowing the development of full-text repositories of scientific literature. IODE has thus embarked on the development of the OceanDocs project (<http://www.oceandocs.net>). The information managers and librarians of the participating institutes assist the researchers with the submission of their publications. They also participate in developing regional directories of marine professionals which are part of the Global Directory of Marine (and Freshwater) Professionals (<http://www.oceanexpert.net>).

PROVIDING QUALITY CONTINUING EDUCATION

The ODIN projects are self-driven: the participating countries and experts determine the institutional, national and regional priorities through regular (mostly annual) assessment and planning workshops where successes and failures are reported, and where adjustments to the work plan are discussed and adopted. International experts play an advisory role and IOC/IODE facilitates.

The self-driven nature of the ODINs empowers the participating individual experts to determine the further development of their institutions as well as of their own careers. Most participants have become more vocal and have gained more confidence in their own capacity, leading to more active participation and increased visibility at the national and international level.

Whereas marine librarians in developing regions worked largely in isolation, the development of ODINs has led to the creation of social networks between the participating librarians. This has even led to the creation of additional networks at the national or regional level. The networks allow not only resource sharing but, more importantly, promote learning through the sharing of expertise and experience. In addition, ODINs have been instrumental in providing formal continuing education for information staff.

The following description of the ODINs' training programme is presented within the framework of "Continuing Professional Development: Principles and Best Practices,"¹ found on the IFLA website at <http://www.ifla.org/en/cpdwl>.

Regular learning needs assessment. Up to 2009, training courses have been organized with a regional focus (ie, separate courses for each ODIN). The contents of these courses were always decided in close cooperation with the target group and based upon their needs to effectively participate in the activities of the ODIN projects. Then experts were invited to contribute knowledge and teach. Thanks to support from the Government of Flanders (Belgium), since 2009 the IODE program is able to organize a wider range of training courses on a more regular basis and on a multi-regional scale. In order to assess training needs, to prioritize and to enable cost-effective planning of courses, the IODE Project Office has created two web-based surveys through which oceanographic data managers or marine information managers can identify their training needs. On the basis of the results of the surveys a course program is prepared and implemented. Participants may be sponsored (by IODE or others) or self-supported. The advantages of this new approach are several: (1) better response to changing training needs; (2) promotion of south-south and north-south cooperation.

Broad range of learning opportunities, structured in modules to cover topics from introductory through advanced. In accordance with this general principle and in order to achieve its objectives, IODE offers learning opportunities at the regional and international level. Especially since the mid-1990s, technological development, especially on the Internet, has been considerable, but most librarians in

developing countries have not been able to further develop their skills as needed. Accordingly a core component of the ODIN strategy is the upgrading of skills of participating librarians, especially in new applications of information and communication technology.

IODE offers learning opportunities mainly in two formats:

- Live training workshops
- Learning through the Internet, using materials collected in the system named OceanTeacher

These two formats function in synergy:

- Expert teachers (resource persons) can check in OceanTeacher before a training workshop if relevant training and study materials are already available that can be adapted and updated to serve in the coming training workshop;
- Participants (trainees) can use OceanTeacher to familiarize themselves with subjects that will be covered in the training event in which they will participate.

One of the major objectives of IODE is to assist member states to acquire the necessary capacity to manage marine data and information and become partners in the IODE network. It is only when IOC member states have acquired this expertise at the national level that they can become an active partner in IODE and thus share their data and information with the other members of the “IODE family.” The training does not only teach the principles of data and information, but also promotes the use of “standards” amongst all IODE centers and thus achieve interoperability between these centers.

Training activities are hosted by IOC member states or are organized at the IOC Project Office for IODE in Oostende (Belgium). Training workshops have generally been organized for groups with a particular level of expertise: starters or more advanced learners. However, this simple principle (best practice) is hindered in practice by the heterogeneity of participants that cannot be avoided when international networks are set up: participants can differ substantially in age, language, ambitions, background and expertise (natural scientists versus librarians, experience mainly with printed documents or with ICT, and so on).

The importance of training has led IODE to develop OceanTeacher, mentioned above. The objective of OceanTeacher is to provide training tools and study materials for oceanographic data and information management. These are used during IODE training courses but can also be used for self-training and continuous professional development. The OceanTeacher web site has two components:

1. The “OceanTeacher Digital Library” contains software, quality control and analysis strategies, training manuals, and relevant IOC documents. Content for the Digital Library is contributed by an increasing number of experts.

2. The “OceanTeacher Training Curriculum” is a collection of outlines, notes, examples, and other documents used in conjunction with the Digital Library to organise training programs.

Over the years this system has been running on various computer platforms, starting from CD-based over a traditional, classical, static html web site to an open access contents management software platform. The development of the part devoted to information management has been summarized elsewhere.² At the end of 2008 the contents have been transferred to a semantic media-wiki platform.³⁻⁵ IODE chose the wiki-based technology framework as it is an increasingly popular technology used for group-based knowledge writing and sharing. However OceanTeacher has chosen to use a managed rather than fully open system. Only registered users can submit content. This submitted content is subsequently quality controlled by editors. Content providers and editors are experts recognized as such in the IODE community. OceanTeacher is mainly a digital library of materials. When new material is added, this is directly classified according to the subject. This structure assists users in browsing and selecting the contents.

According to best practices, learning opportunities should be offered in modules structured to cover topics from introductory through advanced. Thus also study materials should be offered in an additional structure for browsing, one based mainly on level from introductory through advanced. This would be difficult or impossible to realize with a collection of hard copy study materials. A digital system can be more flexible and powerful. A computer system based on a content management system allows the producers and editors to create more than one view on the contents. Therefore, this opens a road for future development.

Content for the Training Curricula is traditionally prepared by the lecturers participating in the training courses. IODE training courses are organized either at the IOC Project Office for IODE in Oostende, Belgium (<http://www.iode.org/ostend>) or hosted by member states. The technology framework for the OceanTeacher Training Curricula system is Moodle (see <http://moodle.org/>).

Building expertise in continuous education. Best practice in continuing education assigns program management responsibility to someone with expertise in education. In balance with the priorities of the IODE Program and the considerable investments in infrastructure and facilities (hardware as well as software) related to training, a staff member has been designated at the Project Office to manage activities related to training, including further creative development and implementation of tools such as content management system for study materials (OceanTeacher), digital video, and so on.

Dissemination of information about continuing education. Information about continuing education should be widely disseminated, according to the “Principles.” The IODE program has been applying several methods to communicate

with their target audience about activities and resources, including of course communication related to training opportunities and products:

- Newsletters are made available in electronic format. Examples are “Window” (for Africa) and “ODINCARSA Newsletter” (for Latin America).
- Several email lists.
- Several web sites. In addition to <http://www.iode.org>, ODINs have established their own web sites.

Ensuring high quality continuing education activities. Efforts are made to align the learning objectives and tools with identified needs. This is realized for instance through:

- assessment of needs through the Internet, involving potential trainees, managers of the regional IODE networks, experts, and so on, as mentioned above;
- advice provided by formal groups of experts, for instance the IODE Group of Experts on Marine Information Management (GE-MIM), in their yearly meetings;
- feedback from ODIN planning workshops.

Course instructors are experts in their subject domain, mainly practitioners in scientific information management. Best practice means that training activities should follow principles of instructional design and learning theory and course instructors should be experienced and able teachers. Here we face a problem, as not all invited instructors combine subject expertise with significant teaching expertise. Individual feedback from trainees is invited after every training course and the results are taken into account by the IODE management for future planning.

Recognition of continuing learning. Continuing learning activities should be documented in some consistent way and should be recognized in hiring or promotion decisions. This principle is not directly applicable in this case, as IOC/IODE has no hierarchical relation with the professionals participating in a training session. Nevertheless, in the spirit of this principle, members of an IODE network (one of the “ODINs”) who perform remarkably well in training events and in other international activities are selected and officially assigned as mentors or leaders of projects and follow-up activities. In addition, within the framework of the ODIN projects, persistent under-performers may be removed from the project by the partner institution management after consultation with the ODIN project management and IODE Secretariat.

Budget allocation for staff development. A reasonable part of the institutional budget should be earmarked for staff development. This principle is not simple to apply to IOC/IODE and the participating libraries and professionals. In other words, here we do not deal with the internal management of staff development within a particular institutional library. Nevertheless, by extension, we can state

here that a considerable part of the budget of IOC/IODE is earmarked for training activities. In addition, one of the objectives of the ODIN projects is to promote the role of data and information managers at the institutional level. If successful, this may then also lead to a more active staff development policy for data and information managers.

Working hours provided for continuing learning. Best practice requires that employers give staff paid time off – about 10% of work hours – to attend workshops, conferences relevant to their jobs, for in-service training, for other educational activities, and for informal learning projects. In the case of IOC/IODE the partner institutions send trainees to IODE training courses which take place during working hours.

Evaluation of continuing education offerings. Continuing education offerings for staff development should be evaluated. Immediately after each training session, each participant is invited to write a brief structured evaluation of the various courses and instructors. Furthermore, recurring contacts with the same trainees – in some cases over several years – allows a less formal exchange of ideas concerning training needs and their practical realization. Besides the trainees, also experts in the formal IODE Groups of Experts or in the Council evaluate regularly training offerings and concrete products like OceanTeacher. At least for the activities on information management, a bottleneck on the road to better quality is the budgetary limitation (time and funds).

Examination of the efficacy and outcomes of continuing education offerings. The efficacy and outcomes of staff development programs should be assessed regularly. As an extension of the evaluation of the continuing education offerings mentioned above, IOC/IODE continuously examines effectiveness and outcomes. This leads to improvements, to higher efficiency of the programs and products developed. Examples of how this effort has evolved are the following:

- from *ad hoc* somewhat improvised training workshops in various locations to more streamlined training in a well equipped and well maintained training center (the IOC Project Office for IODE in Oostende, Belgium);
- from no collection of training materials provided by external consultants, over collections of files on disk followed by a classical web site, to a digital library on the Internet, based on a state-of-the-art content management system.

HOW DOES UNESCO-IOC-IODE ADDRESS THE THEMES OF “STRATEGIES FOR REGENERATING THE LIBRARY AND INFORMATION PROFESSION?”

Challenging existing organizational structures. One of the primary general aims of UNESCO is to stimulate co-operation on an international scale. Also IOC/IODE assists member states to establish or improve a functional national infrastructure with adequate staff when this is lacking or deserves improvement. One of the efforts is to upgrade and to empower the marine science libraries and information centers to become valuable partners in marine science centers, with more assertive roles and functions than only the collection of printed documents for the local scientists. In the course of recent years information management has climbed in status, coming closer to the respectful position that is occupied by numerical data management. This evolution is partially caused by the rapidly increasing importance of ICT in information management. Implementing the required facilities requires other skills and these are respected highly. On the other hand, the transition from traditional libraries to digital information centers is not a smooth one in many cases, due to conditions that are known quite well in the information world:

- Many information managers are still quite dependent on separate, more or less external computer/ ICT centers and experts.
- Some traditional librarians at the end of their career are not enthusiastic about or able to embrace new ICT.

Developing retention strategies. Retention of trained data and information managers in marine science centers is of course desirable. As in many similar contexts, this cannot be achieved easily. In most developing countries government salaries are low in comparison with those in the private sector. As a result staff trained by IOC/IODE is frequently “headhunted” by the private sector, by other organizations, or promoted out of the information specialty within their own institution to a more senior position.

Developing leaders. Training employees to be good leaders is desirable in many cases but not easy. Many even doubt that leadership can be learned. In the case of IOC/IODE, a few training sessions and more informal contacts cannot “upgrade” employees to become valuable managers / leaders. However several trainees have clearly emerged as natural leaders and have contributed substantially to the active development of their ODINs. In addition efforts are made in contacts with information managers to convince them of the following ideas related to management and leadership, in training courses with practical exercises and assignments:

- Taking over ICT from ICT experts partly into one’s own hands, in own management, offers advantages, certainly in the long run.

- The skills required to make clear and convincing presentations in a scientific environment, supported by computer and digital projector, are not only desirable for top management but also for information managers.
- Information managers who perform well are given a role as “leader” or at least as mentor and resource person in some concrete project that is going on in some regional network.

Creating a positive work environment. A positive work environment fosters productivity and is therefore desirable, for employee as well as employer. Also here IOC/IODE cannot directly intervene in the work environment of the employees in the marine science centers. Nevertheless efforts are made in the following ways:

- better computer facilities and access to Internet
- higher status of information management
- training courses and workshops as well as opportunities for continuous learning and functioning in a more international context.

Teambuilding. Feeling that one is a valuable member of a good team also fosters productivity. IOC/IODE considers training courses and workshops as teambuilding events. Furthermore, the “team” is enlarged from the local national center to a regional, international “team”.

Mentoring and coaching. IOC/IODE encourages the mentoring and coaching. Experts from marine science centers and from universities serve as mentors to guide information managers in the network. Gradually this role is taken over by leading information managers of the ODINs.

Involving professionals in professional associations. IOC/IODE recommends that information managers who participate in one of the networks join professional associations such as the International Association of Aquatic and Marine Science Libraries and Information Centers (<http://www.iamslc.org>). Within the framework of ODINs, membership in some cases is sponsored by the project.

Re-skilling. The evolution from traditional librarians working with printed materials to more contemporary and assertive information professionals working with ICT tools and methods is unavoidable. The efforts made by IOC/IODE in this context are described above. The hope is that the workshops and online training serve as vehicles for “re-skilling.”

CONCLUSION

The programme for International Oceanographic Data and Information Exchange of the Intergovernmental Oceanographic Commission of UNESCO stimulates the management and exchange of marine data and information on an international

scale. An important component in the programme is offering opportunities and products for continuing professional development to information managers in the subject domain of marine science. This training environment is exciting and challenging due to factors like

- the international scope and heterogeneity of the expert trainers as well as trainees and
- the application of information technology which is evolving quite fast.

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