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Preservation of the Archival Content: Teaching and Learning materials at HIOA Institutional Repository

ABSTRACT

Colleges and universities are increasingly creating institutional repositories (IRs) in order to capture, preserve, and reuse the intellectual output of teaching and research activities. This study investigates the development of institutional repository at Oslo and Akershus University College of Applied Sciences (HIOA) with the purpose of to identify the types and formats of learning and teaching materials produced by faculty members and extend specific metadata elements according to educational objectives. Metadata is a core issue for the managing of institutional repositories successfully. Different institutional repositories have selected and applied different metadata models and elements for describing preserved digital documents. Thus, this paper is aims to adopt an appropriate metadata scheme to the relevant digital documents contributed by the HIOA community. This study adopts a qualitative method based upon conducted face-to-face interview and online questionnaire which is used for data collection.

Keywords: Institutional Repository, preservation metadata, learning and teaching materials, digital preservation, metadata, preservation metadata standards.

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List of Abbreviations

AIP- Archival Information Package

AIS- Archival Information System

DC – Dublin Core

DCMES- Dublin Core Metadata Element Set

EAC- Encoded Archival Context

EAD- Encoded Archival Description

ERPANET- Electronic Resource Preservation and Access Network

IP- Information Package

ISO – International Organization for Standardization

HIOA – Oslo and Akershus University College of Applied Sciences

METS- Metadata Encoding and Transmission Standard

OAI-PMH- Open Archives Initiative-Protocol for Metadata Harvesting

OAIS- Open Archival Information System

PREMIS- PREservation Metadata: Implementation Strategies

TERMINOLOGY

The following relevance terms to the study have been selected from PREMIS data dictionary for preservation metadata version 2.0 (PREMIS 2008) and the ISO reference model of open archival information system (ISO 14721:2003)

Archival Information Package (AIP): an information package, consisting of the content information and the associated preservation description information (PDI), which is preserved within an OAIS.

Digital Object: discrete unit of information in digital form. A digital object can be a representation, file, bitstream, or filestream.

Digital preservation: applies to both born digital and reformatted content. It combines policies, strategies and actions to ensure the accurate rendering of authenticated content over time, regardless of the challenges of media failure and technological change.

Entity: Abstraction for a set of "things" (intellectual, agents, events, object, right) described by the same properties. The PREMIS data model defines five types of entities: intellectual entities, objects, agents, rights, and events.

Event: action that involves at least one digital object and/or agent known to the preservation repository.

Intellectual Entity: coherent set of content that is described as a unit, for example, a book, a map, a photograph, a serial. An intellectual entity can include other intellectual entities; for example, a web site can include a web page, a web page can include a photograph. An intellectual entity may have one or more representations.

Long-Term: A period of time long enough for there to be concern about the impacts of changing technologies, including support for new media and data formats, and of a changing user community, on the information being held in a repository. This period extends into the indefinite future.

Metadata Schema: A formal specification of the semantics and structure of a coherent collection of attributes that can be assigned in the description of a resource, as well as constraints that may apply to such descriptions.

Metadata: data about other data.

Open Archival Information System (OAIS): An archive, consisting of an organization of people and systems that has accepted the responsibility to preserve information and make it available for a designated community. The term Open in OAIS is used to imply that this

recommendation and future related recommendations and standards are developed in open forums, and it does not imply that access to the archive is unrestricted.

PREMIS (PREservation Metadata: Implementation Strategies) Data dictionary: common data model for organizing/thinking about preservation metadata and guidance for local implementations. It is standard for exchanging information packages between repositories.

Preservation Metadata: information a preservation repository uses to support the digital preservation process.

Rights: assertions of one or more rights or permissions pertaining to a digital object and/or an agent.

Schema: a systematic, orderly combination of elements or terms.

CHAPTER 1
INTRODUCTION

This introductory chapter outlines the clarification and basic aspects for this research. First, background information guides to the discussion of the research problem. The statement of the problem describes the preservation metadata standards implementation. Then the aims and objectives, research questions and the methodology used in the research are discussed.

1.1 BACKGROUND

In the information age, the major part of the information, including learning materials, is born digital, while paper based information is also being transformed to a digital form. Thus, the preservation and availability of learning resources is a common objective for universities, libraries, archives and other knowledge-intensive institutions. Institutional repositories are a wide spread tool for holding all kinds of material originating from the intellectual production by the members of the institution concerned. By definition, in the repositories, besides of typical scientific production (peer-reviewed), administrative and educational content produced by faculty, students, and staff that reflect the intellectual environment, can also be preserved and disseminated.

1.2 STATEMENT OF PROBLEM

Digital preservation is a set of procedures, accomplishments and managing of digital information over time, aimed to guarantee the information's long term availability. However, due to development and improvement of information technology systems, there are challenges, such as continuously upgraded and outdated hardware and software systems used to store and access digital objects.

To provide the long-term accessibility of digital objects, metadata is a significant factor. Preservation demands special elements to capture the origin of a digital object, to detail its physical features, and to document its performance in order to match it on future technologies.

In this context, the preservation of various learning type of materials repository managers confront the difficulty of describing, with the same metadata schema. That requires specific

meta-information to identify all their particular characteristics. If such resources are collected in one repository and described with the same metadata schema, on the one hand there is the advantage for interoperability, but on the other hand, there is the risk of losing a great deal of specific information.

Generally, institutional repositories have implemented the Open Archives Initiative-Protocol for Metadata Harvesting (OAI-PMH) as the metadata harvester mechanism to achieve interoperability in the exchange of meta-information with other systems. For handling it to use and build up the records in the unqualified Dublin Core metadata schema or DC-Simple (Dublin Core Metadata Element Set, ISO 15836) is necessary. However, if the used software allows it, each repository is able to use any supplementary metadata schema to document its resources.

The focus of this study is to find out what types of learning materials the faculty members of HIOA wish to preserve in the repository. And to suggest a Qualified Dublin Core metadata schema covering all revealed different file types.

1.2.1 Oslo and Akershus University College of Applied Sciences (HIOA)

HIOA is Norway's largest state university college, with a student body of approximately 16,000 student and 1,600 employees. HIOA has four faculties located at two campuses: Pilestredet and Kjeller. It has four faculties: Faculty of Health Sciences, Faculty of Education and International Studies, Faculty of Social Sciences, Faculty of Technology, Art and Design. It offers more than 50 Bachelor Programs, 25 Master Programs, three PhD programs and a large number of other courses.

HIOA Learning Centre is the heart of education and research for its students and faculty members. The library system contains links to reliable and credible sources and different electronic services for the users. The sources and services are accessible to users on and off campus. It has a department for digital services (the digital library) with 4-5 employees and is responsible for the learning centre website, the digital publications, the management of shared electronic information resources, and the research documentation for HIOA.

The HIOA have an institutional repository named ODA (Open Digital Archives). It includes peer-reviewed journal articles and other scientific documents, approved theses of master and PhD students from HIOA's own research programs. Faculty members should upload their scholarly journal articles here. This applies to documents published after 01 January, 2010. In those cases where journals do not allow open publishing, or where the co-author does not approve the publication, the publications are stored in a closed archive.

The Learning Center of HIOA has identified that other than peer-reviewed articles and master or PhD theses, there are lots of materials like conference presentations, lecture slides, streamed/ taped lectures, bachelor theses, non-reviewed articles, chronicles, images, and so on that are still beyond any preservation. The faculty members of different faculties have lots of materials and they are preserving it by themselves in a scattered way. There is no single system in existence that can provide a secured space to preserve these materials for long term preservation. In addition, users of these materials do not know a specific place where they can find all of them together. For example, a senior professor with all his knowledge and resources available with him, is an asset of HIOA, may retire after some days, and only s/he knows where the materials are. When s/he left the HIOA, s/he unwillingly took all the intellectual output that s/he generated during her/his tenure. Sometimes, a new lecturer of the same course needs to start from the scratch. In a way it could be said that HIOA is losing its knowledge.

1.3 AIMS AND OBJECTIVES

The principal aim of this thesis is to study the types and formats of learning and teaching materials produced by faculty members at HIOA, and extend specific metadata elements according to found educational objectives.

The key objectives are:

- To identify the type and format of learning and teaching materials created and used by faculty staff
- To determine the metadata fields which faculty members prefer for digital documents
- To study how international metadata standards have been adopted for the digital preservation process.

- To compile a specific metadata schema regarding discovered learning and teaching documents for preservation

1.4 RESEARCH QUESTIONS

The central questions to this study are:

1. To what extent are faculty members interested in preservation of learning and teaching materials and what type of materials are the most important?
2. Which additional metadata schema or elements can be suitable for effective description of learning and teaching materials?

1.5 SIGNIFICANCE OF THE STUDY

An institutional repository is a digital assets management system that allows the deposit and subsequent distribution of digital files. Institutional Repositories (IR) are becoming an increasingly important type of special resource and service offered by libraries (Li et al., 2011). Libraries are building repositories to archive the intellectual output of their faculty members, scholars and students. Institutional repositories also include non-peer reviewed published materials. It is estimated that only 13 per cent of the materials in institutional repositories are peer reviewed (Shreeves, 2009). IR often contains presentations, historical research conducted at the university that has been converted into digital form, working papers, technical reports, electronic theses and dissertations, and data sets (McDowell, 2007; Shreeves, 2009). Moreover, non-peer reviewed literature is nonetheless an essential part of scholarly communication, often presenting research data in a more timely and detailed manner than is possible in formal publications (Genoni, 2004).

The Learning Center of Oslo and Akershus University College of Applied Sciences (HIOA) have already implemented an institutional repository named ODA (Open Digital Archives) for peer-reviewed publications and master theses. However, the faculty members are publishing those things by using different programs and sharing the same in diverse ways. It is highly believe that a centralized system is essential to preserve this intellectual output and to reuse and share the same with the concerned community.

Metadata is central issue to digital preservation processes; very few resources on the specific metadata schema for preservation exist, and the submission of it into practice is limited due to the complexity of the subject area learning materials involved with preservation.

Moreover, the result of this study will expectantly be beneficial in promoting further research on the same topic.

1.6 Outline of the Thesis

The first introduction chapter of this study delivers a basis for the research by providing background information. The research problem, the objectives and research questions of the paper are explained.

Chapter two- literature review is related to the subject and provides an overview of institutional repositories, digital preservation issues; preservation metadata standards and their implementation issues are reviewed.

The third chapter outlines the methodology used in this research project. The data collection and analysis methods are discussed.

Chapter 4 contains the data analysis and main findings. It explores the main items that regarding with the objectives and research questions of the study.

The final chapter presents conclusions from this research project and offers recommendations and suggestions for further research.

CHAPTER 2

LITERATURE REVIEW

2.1 BRIEF HISTORY OF INSTITUTIONAL REPOSITORY

The first presentation of an institutional repository can be traced back as far as the seminal articles by William Gardner and Stevan Harnad in 1990, when networked electronic communication was starting to become a viable tool for the dissemination of scholarly literature. In his article "Scholarly Skywriting and the prepublications continuum of scientific enquiry", Harnad states that:

> "The whole process of scholarly communication is currently undergoing a revolution comparable to the one occasioned by the invention of printing …all that prepublication interaction clearly is continuous with the lapidary stage at which the manuscript—usually further revised in response to peer review—is accepted and archived in print."(Harnad, 1990)

These early moves towards digital repositories later were primarily suggestive of disciplinary archives, borne out by the establishment in 1991 of the Los Alamos arXiv1 for high-energy physics (now based at Cornell). In 1994, in response to Harnad's the first scholarly recorded proposal about an institutional archive came later by Okerson and O'Donnell "Subversive Proposal for Electronic Publishing" in which stated:

> "For centuries, it was only out of reluctant necessity that authors of esoteric publications entered into the Faustian bargain of allowing a price-tag to be-erected as a barrier between their work and its (tiny) intended readership, for that was the only way they could make their work public at all during the age when paper publication ... was their only option." (Okerson and O'Donnell, 1995)

The notable discussions took place among concerned scholars. These included the technical requirements at the time, centralized versus decentralized storage models, and the solution of the copyright issues that would play a main role in the self-archiving debate.

> The discussion and movement was also primarily driven by the scholars themselves rather than librarians; this is not surprising, since the practice of circulating preprints of articles between academics has long been commonplace. Again, though, the skills required to operate the modern institutional repository have long resided in the library, and their involvement is virtually necessary. (Jones, 2006)

[1] www.arxiv.org

At the beginning of the millennium a wide amount of literature on the institutional repository topic began to develop. Between 2001 and 2003 there was an increasing number of articles devoted the basic work for institutional repositories, most notable among them is“The Case for Institutional Repositories” (Crow, 2002) which came from the Scholarly Publishing and Academic Resources Coalition (SPARC). In that paper Crow defined institutional repositories as "digital collections capturing and preserving the intellectual output of a single or multiple-university community." He suggested the two main functions of IR:

> Firstly "serve as tangible indicators of an institution's quality and to demonstrate the scientific, societal, and economic relevance of its research activities, thus increasing the institution's visibility, status, and public value"; Second: to provide tools to assist universities "re-shape the scholarly communication process". (Crow, 2002)

Essentially, Crow considered that institutional repositories would facilitate universities to develop the new digital networked world to regain control of scholarly communication. He said,

> “When the functions are unbundled and begin to operate separately, each can operate more efficiently and competitively.” (Crow, 2002)

Crow stated that, if researchers retained copyright in their papers and preserved them in institutional repositories, the publisher's role could be restricted to activities like managing the peer review process, creating value-added "overlay" journals based on the content of the repositories, and providing services like "citation linking, controlled vocabularies, and the like". And this would allow universities to restore a more equitable power balance. In other words, institutional repositories would allow universities to create a more cost-effective model, and force that model on publishers.

2.2 THE DEFINITION OF THE INSTITUTIONAL REPOSITORY

Different authors have used a variety of ways to define institutional repositories according to sorts of content types: gray literature, working papers, technical reports, books and book chapters, conference papers and posters, and even some administrative records. Some wide working definitions have been tried to cover the functions of this repository type. For example, Clifford Lynch defines it as:

> "...a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is most essentially an organizational commitment to the stewardship of these digital materials, including long-term preservation where appropriate, as well as organizational and access or distribution" (Lynch, 2003)

While Lynch defines the institutional repository as primarily service orientated, and by commitment from the institution, Raym Crow defines it from a slightly different view angle as:

> "any collection of digital material hosted, owned or controlled, or disseminated by a college or university, irrespective of purpose or provenance" (Crow, 2002).

Crow goes on to note that the college or university boundary is not limited, government departments, non-governmental organiations (NGOs), museums, independent research organisations, federations of societies and even commercial entities also could use and benefit from an institutional repository.

Further discussions on these covered with other library information systems such as subject repositories, learning object repositories, institutional record archives, library catalogues and metadata aggregators. The boundaries between all these are not clear, for example, institutional repositories containing learning objects or institutional records. In addition, the "learning object" itself could include materials such as journal articles.

2.3 INSTITUTIONAL REPOSITORIES AND ARCHIVAL CONTENT

Most modern institutional repositories are primarily e-print and e-thesis archives, most likely because of the development history and origins of the repository. Other content types such as multimedia, course materials and datasets are emerging, but they are yet to be considered commonplace.

Making Institutional Repositories a Collaborative Learning Environment (MIRACLE) project sought to collect data from a broader population and to include data from institutions that had just started establishing an IR. The team's findings supported many of the conclusions Bailey (2006) made, their survey added by asking questions about which library staff were most involved in IR development, what content recruitment strategies were most effective, how the functionality of IR software might be improved, and the nature of IR content, among others. They conducted interviews with a sample of thirty-six respondents, focusing on staff perceptions of the purpose of IRs and the features, policies, services, and challenges

associated with their project. They found that most rationales touched on four motivations: to centralize hard-to-find digital content, to preserve scholarly content produced by the university, to provide open access to scholarship, and to advance a new model of scholarly communication. Respondents referred to IRs by different names—for instance, "distributed institutional repository" or "digital repository"—depending on how the IR was being conceptualized within the institution. This led the authors to conclude that IRs are often goal-driven rather than function-driven in the university context—their content and configurations reflect the unique characteristics of the institutions implementing them.

Buehler and Trauernicht (2007) describe the experience of a library that simply converted an existing digital library into an IR, defining

> "… their open access institutional repository in a broad sense as an archive" housing
>
> a host of both published and unpublished materials (Buehler & Trauernicht, 2007)

These articles begin to uncover the complexity inherent in IR projects, which can differ widely depending on the institution's culture and conception of what constitutes an IR. Where some embrace archival science and archival materials, others focus on the traditional IR domain of faculty research, which within the traditional print model of library stewardship tends to fall outside the archival purview.

Several studies have determined that IRs suggest very little faculty need or want in terms of services and functionality (e.g., Kim, 2007; Zuber, 2008; Salo, 2008; Choudhury, 2008). On the one hand, writers like Dorothea Salo (2008) argue that

> …the failure in faculty recruitment has led IR developers to "open the repository to any sort of content in order to justify its existence," including traditional archival content.

On the other hand, researcher like Paul Conway (2008) claim for a wider view that covers the content of the IR as traditionally theorized into a more strong "digital asset management" frame that links e-records, e-teaching, e-resources, and e-publishing in a distributed system. While the former attitude would seem to decrease the enclosure of archival records in developing IR projects in the long term, the latter assumes the importance of archival science to the sustainable management of digital materials.

Several articles argue that digital curation and preservation services represent a major potential draw for faculty and other IR stakeholders, especially in the sciences, but that IRs

have not adequately addressed preservation to date (Choudhury, 2008; Witt, 2008; McGovern & McKay, 2008; and Lee & Tibbo, 2007). In their essay exploring the parallel, and sometimes intersecting, histories of IRs and digital preservation programs, McGovern and McKay (2008) claim that the ongoing problems librarians have encountered in providing open access to digital scholarship and recruiting content from unwilling faculty have led IR developers to downplay, if not outright ignore, issues of digital preservation (p. 267). Archives field has been working on the problem of digital preservation for over two decades, culminating in such milestones as the Open Archive Information System (OAIS) and a number of certification standards for "trusted digital repositories" (p. 264-65). But IRs have been slow to adopt archival standards for preservation, perhaps partially owing to the fact that archival standards for digital curation and trusted repositories are still being debated (Lee & Tibbo, 2007).

2.4 INSTITUTIONAL REPOSITORY and OAIS

The Open Access Information System (OAIS) is a high-level reference model that provides a common language and layout for the definition of "an archive, consisting of an organization of people and systems that has accepted the responsibility to preserve information and make it available for a Designated Community" (CCSDS).

Beedham et al. (2004) discuss the history of the OAIS reference model. It was first developed by the Consultative Committee for Space Data Systems (CCSDS). Although the CCSDS was initially to address the problems of archiving data obtained from observations of the terrestrial and space environments and used in conjunction with space missions, it soon took an intentionally interdisciplinary view and ensured broad participation in the discussion of a reference model for the long term storage requirements of this digital information. Development of the reference model began with the premise that one of the greatest challenges in accepting preservation responsibility within an organisation is finding a shared vocabulary for stakeholders with a variety of backgrounds to use for productive discussion of the issues. Thus, the model was first developed to establish common terms and concepts, to provide a framework for elucidating the significant entities and relationships among entities in an archive environment, and to serve as the foundation for the development of standards supporting the archive environment. A broader task for the OAIS development has been defined as articulating the functionality and components of any system responsible for preserving any type of information over any length of time. The terminology used to describe

the OAIS are often not the traditional archival or recordkeeping terminology since it is intended as a common language within which a diversity of communities can continue to implement and develop the OAIS model. The model has been very successful in one of its main goals to spur further interest and discussion of digital preservation and archiving issues and standards. The 2002 CCSDS version of the OAIS reference model was proposed and was accepted as an international standard in 2003: ISO 14721:2003 Open archival information system Reference model. (Beedham et al, 2004).

Knight and Hedges consider that,

> A key advantage of the OAIS reference model is its emphasis on abstract design and subject-independent terminology. It offers significant flexibility to system designers wishing to map the OAIS to their own repository, enabling them to interpret its use in a manner that is relevant to their field of expertise and content type. Any repository that actively accepts a digital resource, stores and manages it in a controlled environment, and makes it available to an end user can claim to be OAIS- compliant. (Gareth Knight, Mark Hedges, 2007)

2.5 THE PURPOSE OF THE OAIS MODEL

The OAIS reference model addresses a full range of archival information preservation functions including ingest archival storage, data management, access, and dissemination. It also addresses the migration of digital information to new media and forms, the data models used to represent the information, the role of software in information preservation, and the exchange of digital information among archives. It identifies both internal and external interfaces to the archive functions, and it identifies a number of high-level services at these interfaces. It provides various illustrative examples and some "best practice" recommendations. It defines a minimal set of responsibilities for an archive to be called an OAIS, and it also defines a maximal archive to provide a broad set of useful terms and concepts (CCSDS, 2002). This reference model (CCSDS, 2002):

- Provides a framework for the understanding and increased awareness of archival concepts needed for long term digital information preservation and access;
- Provides the concepts needed by non-archival organizations to be effective participants in the preservation process;
- Provides a framework, including terminology and concepts, for describing and comparing architectures and operations of existing and future archives;

- Provides a framework for describing and comparing different long term preservation strategies and techniques;
- Provides a basis for comparing the data models of digital information preserved by archives and for discussing how data models and the underlying information may change over time;
- Provides a foundation that may be expanded by other efforts to cover long-term preservation of information that is NOT in digital form (e.g., physical media and physical samples);
- Expands consensus on the elements and processes for long-term digital information preservation and access, and promotes a larger market which vendors can support;
- Guides the identification and production of OAIS-related standards.

This model is applicable to organizations with the responsibility of making information available for the long term this includes organizations with other responsibilities such as processing and distribution in response to programmatic needs. Also those organisations and individuals who create information that may need long term preservation and those that may need to acquire such information from such archives (CCSDS, 2002).

2.6 PRESERVATION METADATA STANDARDS

In the past ten years, there have been a number of initiatives intended at developing preservation metadata standards. These initiatives are originating from national and research libraries, the archives and records domain, digitization and other projects.

Some of the initiatives have essentially been more closely structured on the OAIS model's definition of an AIP, e.g., the specifications developed by CEDARS and NEDLIB projects while others have been pragmatic responses to the immediate resource management needs of the institution, e.g., the NLA and the NLNZ (Anderson et al., 2009).

These initiatives work on standardizing preservation metadata specification to solve the problem related to preservation and accessibility of digital materials. As a result, they came up with different metadata specifications and played a great role for the development of digital preservation field particularly in the area of preservation metadata.

2.7 OAIS TO PREMIS - PRESERVATION METADATA FROM THEORY TO PRACTICE

The OAIS Model is the common framework guiding a significant proportion of recent international research on digital preservation. OAIS provides a framework to unify the concepts and terminology in the community (Dappert and Farquhar, 2009).

Both the earlier framework and the PREMIS data dictionary build on the OAIS reference model. The OAIS information model provides a conceptual foundation in the form of taxonomy of information objects and packages for archived objects, and the structure of their associated metadata. The framework can be viewed as an elaboration of the OAIS information model, explicated through the mapping of preservation metadata to that conceptual structure (CCSDS, 2002). The PREMIS data dictionary can be viewed as a translation of the framework into a set of implementable semantic units. However, it should be noted that the data dictionary and OAIS occasionally differ in terminology usage. This is because of the fact that PREMIS semantic units require more specificity than the OAIS definitions provided and which is expected when moving from a conceptual framework to an implementation (OCLC/RLG, 2008).

2.8 PREMIS (PRESERVATION METADATA IMPLEMENTATION STRATEGIES)

PREMIS is a metadata framework to support the preservation of digital objects that uses the OAIS information model as part of its basic structure (OCLC/RLG, 2002).

The PREMIS data dictionary consolidates several earlier efforts to produce conceptual models and concrete metadata dictionaries for implementers of digital preservation services. It define a core set of implementable, broadly applicable preservation metadata elements, supported by a data dictionary and identify and evaluate alternative strategies for encoding, storing, managing, and exchanging preservation metadata(OCLC/RLG, 2008). PREMIS defines five kinds of entities: intellectual entities, objects, agents, events and rights (Caplan, 2009).

Intellectual entity: Set of content that is considered a single intellectual unit for purposes of management and description (e.g., a book, a photograph, a map, a database). It is not fully

described in PREMIS data dictionary, but can be linked to in metadata describing digital representation.

Objects: Discrete unit of information in digital form. Objects are what repository actually preserves. According to PREMIS there three types of objects.

Representation: set of files, including structural metadata, that, taken together, constitutes a complete rendering of an intellectual entity.

File: named and ordered sequence of bytes that is known by an operating system.

Bitstream: data within a file with properties relevant for preservation purposes (but needs additional structure or reformatting to be stand-alone file) (Guenther, 2009).

Events: "an action that involves or impacts at least one object or agent associated with or known by the preservation repository". It helps to document digital provenance and can track history of object through the chain of events that occur during the objects lifecycle (OCLC/RLG, 2008, p.130).

Agents: Person, organization, or software program/system associated with an event or a right (permission statement).

Rights: An agreement with a rights holder that grants permission for the repository to undertake an action(s) associated with an object(s) in the repository.

CHAPTER 3

METHODOLOGY

The chapter on methodology covers the methods and techniques that were adopted in order to meet the objectives or the purpose of the study. It includes the research purpose, research approach, research strategy, population, data collection methods, and finally the limitations that were encountered in the research.: research purpose, research design, research strategy, population of the study, sampling, techniques used to collect data and, how data were analyzed, ethical considerations and limitation of the research.

3.1 RESEARCH PURPOSE

The Learning Center of Oslo and Akershus University College of Applied Sciences (HIOA) already has an Institutional repository, ODA (Open Digital Archives), for peer-reviewed publications. The Learning Center feels the necessity of archiving non-peer reviewed materials and others documents that the faculty members are producing and does not match with the submission standard of ODA. Genori stated,

> Moreover, non-peer reviewed literature is an essential part of scholarly communication, often presenting research data in a more timely and detailed manner than is possible in formal _-publications (Genoni, 2004).

However, the faculty members are publishing those things by using different media and sharing the same by using diverse ways such as Frontier, Dropbox etc. It is highly believe that a centralized system is essential to preserve this intellectual output and to reuse and share the same with the concerned community. This research tries to identify: 1) what type of materials the faculty members have and wish to put in a repository; 2) what are the different file types using by different departments than traditional types; and 3) what should be designed for the specific metadata schema fields or elements.

These issues are important because they have an impact on the functions of the IR, the ability of the repository to carry out its own collection development program in preserving digital materials on campus.

3.2 RESEARCH APPROACH

There are two main research approaches for conducting research in social sciences, quantitative and qualitative research.

Gray explained the difference between the two methods as:

> In quantitative approach results are based on numbers and statistics that are presented in figures whereas the qualitative approach the focus lies on describing an event with the use of words. The approach one chooses depends on the problem definition together with the kind of information that is needed. The two methods can, where suitable, be combined (Gray, 2004).

However, Pickard points out that:

> Whichever paradigm you associate your research with, whichever methodological approach you take, demonstrating the value of your investigation is essential and that all we want is our findings to be believed and we are responsible for ensuring that they can be believed. (Pickard, 2007)

This research applied the qualitative method in order to answer the research purpose and the research questions. This approach is suitable to gain a better understanding what kind of teaching materials faculty members have and determine effective metadata scheme by using the OAIS functional model in digital preservation.

3.3 RESEARCH STRATEGY

In this research we will use a survey strategy. As stated by Kerlinger and Lee,

> "Survey research studies large and small populations (or universes) by selecting and studying samples chosen from the population to discover the relative incidence, distribution, and interrelations of sociological and psychological variables. (Kerlinger and Lee, 2000)

Pickard states,

> The purpose of survey research is to gather and analyse information by questioning individuals who are either representative of the research population or are the entire research population (Pickard, 2007).

Survey research collects data from a sample of individuals through their responses to two kinds of interview: face-to face and online questionnaire. For clarity, the term *survey* should be reserved to describe the research method whereas a questionnaire or survey instrument is the data collection tool. Although survey research projects may use personal interviews, panels, or telephones to collect data. This thesis will consider data collection approaches through semi- structured face-to-face interview and Internet-based questionnaire.

3.4 POPULATION OF THE STUDY

Gray states that,

> Qualitative research often works with small samples of people, cases or phenomena nested in particular contexts. Hence, samples tend to be more purposive than random. Again, in contrast to more quantitative approaches, samples may not always be pre-planned in advance, but may evolve once fieldwork has begun. So an initial choice for informants may lead to a decision to select a more contrasting set of deviant subjects (cases) as a comparison (Gray, 2004).

Face-to-face interview were conducted under the guidance of Professor Ragnar Nordlie, Department of Archivists, Library and Information Science, Oslo and Akershus University College of Applied Sciences for internship assignment from 21 November to 16 December 2011.

The population for face-to-face interview has been selected through e-mail and semi-structured face-to-face interviews have been conducted with seven faculty members of four different departments at the HIOA. The respondents represented the faculty of Engineering (two persons); Department of Archivists, Library and Information Science (one person); Department of Esthetics (three persons), Department of Journalism and media studies (one person).

Online survey was conducted with seven faculty members from three departments at the HIOA. The population comprises instructors for Art, Craft, Drama, Media, Music studies. These three departments included: Drama and theater, Journalism, Communication and Media Studies and Art and design.

The population included mainly representatives from art field in order to find out non-traditional and more various types of learning and teaching materials. In other words, after face-to-face interviews, the population consisted of information- rich case for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research.

The population selected members who are professionals in art field and the assumption was that they would have and produce great significance teaching and learning materials for this research. The survey was sent to the selected population. The respondents were also requested to indicate if they wanted to be interviewed further.

3.5 DATA COLLECTION TOOLS

The data for the research was collected using Surveymonkey online survey questionnaires tool and also face-to-face interviews with selected respondents conducted as a follow-up to the questionnaires. SM online survey tool is one of several on-line questionnaire facilities which are fairly similar, that people can use to create surveys, solicit feedback, and analyze the current market, plan events and more. Typically, creating a survey could be a time-consuming and complicated task without such a tool.

The online questionnaire was constructed in a combination of grading scales, multiple choices, and open ended questions. The researcher provided a brief introduction describing the research topic and the purpose of the research. Most of the questions required the respondent to use grading scales and multiple alternatives. However, the respondents were also provided to express their own opinion for unlimited on discussing in greater depth. The link to the survey was sent to all the respondents by mail.

3.6 DATA ANALYSIS TECHNIQUE

The method for analysis is interpretation of data. This approach relies on the assumption that human experience is shaped, transformed and understood through linguistic representation. It is far more than merely analyzing the words, but analyzing the words based on a shared understanding of form, structure and meaning.

The face-to-face data analyzing has quoted the most significant utterances in unedited form and other utterances have been included in edited form as supportive evidence. All data gathered from respondents' interviews has been transcribed as precisely as possible to get the whole picture of what happened during the interview and thus minimized the chances of the analysis being biased. After transcribing all interviews, the study has categorized of issues in the text in relation to objectives.

Online questionnaire result also has been interpreted according to informants responds.

3.7 MAJOR ADVANTAGES AND DISADVANTAGES OF ONLINE QUESTIONNAIRE

Evans and Mathur (2005) outlined the major strengths and potential weakness for using online questionnaire. Strengts:

Flexibility. Online surveys are quite flexible. They can be conducted in several formats: e-mail with embedded survey; e-mail with a link to a survey URL; visit to a web site by an internet surfer who is then invited to participate in a survey; etc.

Speed and timeliness. Online surveys can be administered in a time-efficient manner, minimizing the period it takes to get a survey into the field and for data collection.

Technological innovations. Online surveys have come a long way from the simple, text-based, e-mail surveys of the 1980s to the technologies available today. Respondents can click on a URL sent by e-mail and be transported to a feature-rich web survey tool that is directive and powerful, or reply directly to an e-mail survey by inputting answers as instructed

Convenience. Online surveys provide convenience in several ways. Respondents can answer at a convenient time for themselves. They may take as much time as they need to answer individual questions. Some online surveys let respondents start and then return later to the question where they left off earlier.

Question diversity. Online surveys are capable of including dichotomous questions, multiple-choice questions, scales, questions in a multimedia format, both single-response and multiple-response questions, and even open-ended questions.

Required completion of answers. Online surveys can be constructed so that the respondent must answer a question before advancing to the next question or completing the survey, and so that instructions are followed properly (such as providing only one answer to a question). This eliminates item non-response and the necessity to throw out answers that that been entered improperly.

Weaknesses:

Respondent lack of online experience/expertise. Although the internet population is becoming more representative, there may still be survey difficulties due to the lack of familiarity of possible respondents with internet protocols.

Technological variations. Online surveys are affected by both the type of internet connection and the configuration of the user's computer.

Privacy and security issues. Respondent privacy concerns remain important. The concerns fall into two categories: the security of transmissions and how data will be used.

Impersonal. As with mail surveys, there is usually no human contact in online surveys. This can limit the ability to probe in-depth as a skilled interviewer could do,

3.8 LIMITATIONS OF THE STUDY

The population for the study was relatively small because sampling comprised of 30 faculty members who represented various department at the HIOA. We have conducted face-to-face interview between 7 faculty members and received 7 responses from the online questionnaire which was a very small number to describe a comprehensive conclusion regarding the research questions.

We faced the difficulties of language problems particularly during face-to-face interview as respondents' native language is Norwegian some of them were not fluent in English.

The assumption was that the population could supply with additional knowledge on effective metadata elements issue, however it turned out that majority of the respondents did not have sufficient knowledge in regard it.
The questionnaire was made short in order to try and increase response rate, and this resulted to shortage of data, which may be helpful in the data analysis.
o time limitations, to collect data from more faculty members would be impossible

3.9 ETHICAL CONSIDERATIONS

The introductory letter was sent to respondents and added to the online questionnaire. The letter introduced and outlined the purpose of the research topic and what was expected from the participants.

Respondents were assured of maximum confidentiality and the data collected from the online survey was anonymously, and it was accessible only to the researcher.

CHAPTER 4

INTRODUCTION

This chapter covers and discusses the results and findings of the conducted research. The findings are summarized and followed by discussions under each sub heading presented in accordance with the stated objectives formulated to guide the study.
Both interviews and questionnaires are taken into consideration for interpretation and analyzing the result of the research.

4.1 DEMOGRAPHIC DISTRIBUTION OF HIOA

As described above chapters of this paper, the level of participation of respondents were found to be very low. For survey questionnaires were distributed among members of the departments of two faculties: Social Sciences and Technology, Art and Design. In this survey study totally 14 respondents took a participation from which 7 was interviewed face-to face and 7 replied online questionnaire. As a result of low response rate from respondents to online questionnaire, the result of face-to-face interview which was done during internship on the same topic was also used for data analysis. The majority of respondents were from the Faculty of Technology, Art and Design (58%) and rest from Faculty of Social Sciences (42%).

4.2 ANALYZING OF FACE-TO-FACE INTERVIEW

In this study, a semi-structured face-to-face interview method has been used for the collection of data. Moreover, the study also tried to gain respondents' opinions, feelings, emotions and experiences, which could be more achievable through qualitative approach. It was also assumed that the participants in the interview could bring up some issues which were not asked for in the questions, or could contribute due to their own experiences of how they face challenges in preserving their own materials for long time or frequent use.

At the beginning of the interview, the respondents were informed about the aim and objectives of the institutional repository. Some additional background about the necessity of such kind institutional repository has also been described. The interview questions were of open-ended type. The respondents were asked the following five questions:

1. What kinds of materials do you like to keep and share in institutional repository? For example, non-peer reviewed articles, class lectures /notes/presentation etc.
2. What kinds of materials do you like to preserve for long term or for archival preservation?
3. What kind of descriptions would you like to see in the user interface or when it is presented to you?
4. What kind of policy like access, uses, etc. do you like to have in the repository? for example Open or close access?
5. What kind of measures should be taken by the HIOA for the promotion of this institutional repository?

Some supplementary questions have also been asked during the conversation based on the flow of interview or sometimes to get further clarification from the respondents. The respondents involved in the study had the freedom to suggest anything they considered relevant to the study. All the interviews were recorded with the kind consent of the respondents.

As for this study first 4 of these questions are relevant we will interpret only them.

4.2.1 PRESENT PRACTICE

It is found that the respondents are publishing their non-peer reviewed materials by themselves but in a scattered way. Respondent # 2 informed,

> *"We teach courses, the course materials are published on course pages on the web, some teachers use the system frontiers…frontiers is a closed system"*

They are also using diverse location and software to publish their materials. Respondent # 2 mentioned,

> *"Most of us put our things on internet ... may be we will do both I mean publish in our own pages and we want as many as possible to read but it will depend how much it will use."*

The respondent wants that the materials should be read by as many people as they need. He does not want to put any bindings on sharing non-peer review articles or documents.

4.2.2 NECESSITY OF PRESERVATION LEARNING AND TEACHING MATERIALS IN IR

The respondents felt that there should be an institutional repository where HIOA faculty could put their materials like conference presentation, lecture slides, streamed/taped lectures, bachelor theses, non-reviewed articles, chronicles, images, and so on. Respondent # 2 stated that

> *"Most of us make materials and want whole world can read it. So, we publish it on web. But, for causes people from other branches of this university, from other universities in Norway or also abroad will not find it. Because these are not organized, they can search the Google and find it among various others type of materials and subjects but not in organized way".*

They also liked to see people from all over the world can read what they put in the repository. Respondent # 5 informed,

> *"It is good idea to have them all together".*

And respondent # 2 mentioned,

> *"... I think that would be a good thing to publish materials that are in scattered ways".*

Respondent # 1 informed,

> *"I think the way we are working, teaching technical courses and we think very much that they probably not have the material in different period to compare. So more organized system is perfect, I think it is important to share."*

Preserving syllabuses, lectures for long period is valuable, students and instructors can go back to see differences among consecutive years.

4.2.3 UNORGANIZED BUT IMPORTANT MATERIALS

The respondents emphasized the importance of materials that may be used as reference after couple of decades. For example, respondent # 5 mentioned,

> *"An assistant professor who used to teach ethics, he left behind lot of materials paper, old newspaper pages so in physical condition, he did like that and he left a lot but it history … it is important history, it is about ethics and different cases from may be 10 , 20, 30 years back in time and so and so. So, these things should be in such a place".*

It indicates that preservation of non-peer reviewed materials is essential in the opinion of the faculty members. Respondent # 4 informed,

> *"We have something databases actually, but they are on the server special server here "tiva", I think that is special for us".*

The respondent indicated that they have some special databases as result of collaborative work and for sharing them publicly. However, author's permission should be taken into account, as well to feel more comfortable with it. Finally respondent # 4 pointed out

> *"This kind of work (institutional repository) would be really great and needed".*

4.2.4 TYPES OF MATERIALS

The respondents have traditional types of documents. However, regardless of that some of them have different kinds of materials than others as well. Respondent # 1 informed,

> *"I have published in pdf, power point, jpeg. I use google docs for my own web page". Respondent # 5 informed, "We have cases here … but, those teachers they were not digital … so everything disappears"*

and respondent # 2 informed,

> "We publish in either in html or in PDF, by law we cannot publish in word".

In addition to lecture notes, some clarifications of textbook are necessary for students. Sometimes, this clarification is done by respective faculty member, and s/he likes to make it available for all other students too, and may reuse for next time. For example the respondent # 2 informed,

"We clarify materials on the textbook that is students are feel very difficult to understand, then we often make additional notes to make it clear, and of course, most students like notes of course in Norwegian. But almost every textbook we have is in English".

Moreover, beside traditional materials, the respondents mentioned about preservation of images of materials that have been shown in exhibition by the students or faculty members. For instance, the respondent # 6 & 7 informed,

"It would be PowerPoint presentation, PDF, even documentation of students activities, like syllabus, course curriculum … our students do exhibitions, and rest of the class program, but we do not have documentation on this. So, that would be main focus".

In this case, descriptions of the same materials are important as respondent # 6 & 7 stated,

"It would be images and a little bit of text in some".

Selected pages of Newspapers are considered as important materials for the repository as respondent # 5 informed,

"New case like 22 July, I think it may be those newspaper pages would be in such a place".

In addition, the video and audio of internal and external lecturers' presentation or works and students' project are very important as mentioned by Respondent # 6 & 7,

"... PDF and images are very traditional format. Other than these, video and sounds".

Moreover, some respondents emphasized on preservation of software that are built by HIOA faculty members or students as open source as respondent # 2 informed,

"The bachelor projects made by students here, very often contain software … and probably be interest on other…..in case of software developed in here that would be possible" .

Reports are also considered by one of the respondent as respondent # 5 informed,

" … I have couple of reports that would be nice to put in such a place".

Simultaneously, respondent # 6 & 7 informed about the images and activities and news of student's exhibition as one of those as uttered

"I want to install access to student's exhibitions to help the activities in master level".

The respondents liked to preserve conference proceedings or related materials as mentioned by respondent # 6 & 7,

"Conference materials, yeah that might be".

Moreover, they emphasized on the importance of non-peer reviewed articles

"I am sure, some colleague would have, may be, more like popular".

Respondent #1 informed,

"My lectures, presentations, are open to use, probably given presentations in conferences in Norway which out of available could be interesting"

The respondent indicated that lectures, presentations, guest lecturers' materials, presentations given in various conferences now is accessible only in his own web page, but preserving all of them in one place sounds good idea. Respondent # 3 informed,

"Lecture notes and exercises for students".

At the same time, the respondent was eager to keep course syllabus and to share as much as possible. Having one place which permits to find and search everything much easier is good idea for him. Respondent # 4 informed,

"Ceramics, we use manuals but students want to use in combination with pictures with written text or certain/circle things and … it is not static … We have the frontier system. They could put in the frontier system but that also rather closed."

According to respondent # 4, the concerned department is using pdf, PowerPoint presentation, html, pdf documents and do not have many videos, but the number may in increase soon. The department has a lot of images and likes to put them all together.

4.2.5 ARCHIVAL PRESERVATION

The respondents like to put their materials as archival preservation. Respondent # 5 informed,

> *"...In addition to thesis and such things, we do record artist as part of the study and they do a lot of things that are relevant and interesting to use in other connections and I think that could be an idea to try to have this systemized and to have that student work in the database accessible for us. That could be a record for history and then you could go back and see to identify what students produce in 2005 and so on it could be nice."*

Sometimes, it is vital to go back to see what they did on the same course/program couple of years back. Respondent # 2 stated

> *"Very often when a student takes part in a course and that course is part of another education then they have to verify what was the course five years ago and that lost, then the system is very useful".*

It will be also helpful for graduates who need to confirm their course syllabus after their graduation for further education. On the other hand, Respondent # 2 informed,

> *"... Teaching materials does not last as long as like 10 years specially within computer science where I work materials are five years or too old and we need to renew our materials every second year".*

It is clear that all the teaching materials might not be of interest by the faculty members for long term preservation as well. Respondent # 4 informed,

> *"I think if you to preserve for long time.... it can be up to teacher to decide what to have in a long term ... built a system that have some sort of quality control on what we want to preserve for a long time".*

According to respondent # 4, having the quality check is vital for long term preservation and proposed institutional repository.

4.2.6 GUEST LECTURERS MATERIALS

Guest lecturers are very often welcome as experts of a topic. Sometimes the audio or visual recording of the lectures have been made and preserved by the concerned course teacher.

Sometimes, these lectures or class presentations or papers of guest lecturers, may be reusable in the following years or the students may like to consult the same frequently during the entire program. However, respondent # 2 informed,

> *"Guest lecturers ... cannot be read it alone, we will read with rest of the course. So I don't know an isolate guest lecture will be interest not, ... because all these lectures are part of ongoing course. So, it should be read together with other materials".*

And therefore, it is clear that the contents of guest lectures are useful when it is available with other materials of the same course. Then it is strongly necessary to find a common place to keep these. Respondent # 1informed,

> *"... If guest lecturers hoped; so, it should be there. How content should be used, agreeing with lecturer, I think this will be very good for my course..."*

The respondent considered license issues regarding guest lecturers' materials.

4.2.7 BACHELOR THESES

Currently, the ODA of HIOA is not preserving any bachelor theses. However, those are also intellectual outputs and needed to be preserved. Respondent # 2 stated,

> *"We already published the bachelor thesis ... we are publishing that on internet on web for many years and that's good probably be organized and common pass probably for whole college ... We have own system for publishing it and other have their own system; may be not have any system at all and if the whole college could have a common system that would be nice."*

According to respondent number two, some departments are publishing bachelor theses on the web in their own way without using any centralized system. He felt the need of centralized system for bachelor thesis and emphasized that the whole college should be under one umbrella. However, he also identified the critical issues about copyright and right of organizations or industries who collaborates those theses. Respondent # 2 stated that

"Our bachelor projects are with we collaborate with industries and quite often sometimes the industries said no, we cannot publish it because it contains secrets so we can have a paper copy and we cannot publish it on net but that's common that most bachelor projects cannot be published".

Therefore, before publishing these bachelors' theses in institutional repository, there should be a formal agreement between HIOA and the organizations or industries.

4.2.8. FORMAT OF DOCUMENTS

Majority of the respondents informed that they use traditional formats of documents that are easily available with package software like MS Office or Open Office or Adobe. Respondent # 2 informed,

"I do not think of any other than traditional".

And Respondent # 5 informed,

"Newspaper pages in PDF and JPEG, no other format than traditional format for me".

The whole transcribed records can be found in the appendix 2.

4.3 ANALYSIS OF ONLINE SURVEY

Closed questions including the multiple dichotomous questions and the Likert scale were used for online survey design.

Pickard wrote,

> There is also the multiple dichotomous question, which provides a list of possible responses and allows the respondent to select any number of choices from the list… The Likert scale is a bipolar scaling technique, which allows a respondent to select a choice that best demonstrates their level of agreement with a given statement. (Pickard, 2007)

At the introduction of the interview, the respondents were informed about the aim and objectives of the survey. The respondents were asked the following six questions:

1. What area do you teach in?

According to the first question replies respondents are teaching in art, craft, media, music and storytelling, however, two of respondents have selected two more answers which mean they should have various learning materials for different subjects.

2. What kinds of teaching and learning materials would you like to preserve and share in the institutional repository?

It is clear from the answers to the second question that respondents have a number of non-peer-reviewed teaching materials. The replies shows faculty members have a wide number of course related materials, conference presentation and stream, symposium contributions, images, video streams and thesis or projects prepared by undergraduate students etc.

3. What kinds of teaching and learning materials would you like to preserve for short or long time preservation? Here short time preservation means digital materials will remain accessible and usable for a defined period of time, long preservation means digital materials will remain accessible and usable for over the long and indifenate period.

The majority of the respondents replied to the third question that they prefer to preserve course related materials such as video strem (5), conference presentation and stream, symposium contributions (4), exercise or assignments for students, audio taped lectures (3), thesis or projects prepared by undergraduate students (3), web sites about teaching and research activities carried out by faculty and staff members (3) for short or long term. respondents However, survey showed respondents also have some materials rather than digitalizing in current IR at university. It is found out that the respondents wanted to preserve their own teaching and learning materials as well as guest lecturers' materials.

4. When describing a typical material in the user interface of the archive: what describing elements do you think are most important?

By answering to the forth question of the questionnaire which is asking about metadata most of the respondents selected traditional describing elements such as creator, description, publisher, subject, tittle for searching interface.

5. What are the file format you usually use?

Based on the fifth question of the conducted survey, a diverse formats of materials has been found that are using by the respondents of the different faculties. For example, word document, pdf, excel, powerpoint, photoshop, audio mpeg, jpeg, html, spss, tiff etc.

6. Would you be willing to be contacted for supplemental questions?

Only two of the respondents provided contact information.

The whole online questionnaire results can be found in the appendix 3.

4.4 DISCUSSION

As the result of both conducted survey it seems as if respondents have a wide number of various non-peer-reviewed materials. Faculty members are publishing those in their own way due to unavailability of any centralized system. However, they would like to share their learning and teaching materials in a centralized system so that could be read and used by others easily. They also like to see people from all over the world can read what they deposit in the repository.

The majority of the respondents informed about that they use traditional format of documents that are easily available with package software. However, they also have some materials that are different than traditional ones. It is found that the respondents also like to preserve their own materials as well as guest lecturers' materials. In both cases, copyright issue and required permission are highly considerable.

The respondents also put value on materials that may be used as reference after a couple of decades. They are concerned about the loss of knowledge due to retirement or leaving of HIOA by faculty members. It is evident that this kind of loss should be minimizing as much as possible. The majority of the respondents considered the preserving learning materials in the institutional repository as vital one which can reduce such kind of loss in the long run.

Bachelor theses are welcomed by faculty members to be published in the institutional repository. However, there should be some quality control before finally publishing those. In addition, formal agreement between HIOA and the organization or industries are needed as some of the theses or project may contain non-shareable data.

Based on the conducted face-to-face interviews and online survey, a diverse types of materials has been found that are using by the different faculties. For example, non-peer-reviewed publications: books, journal papers, dissertations for bachelor degrees, conference and symposium contributions, class notes, class lectures, presentations, audio or video of class lectures by internal or external teacher, course information, class syllabi, instructor's notes, reports on experiments, reports on research progress, statistical data, and information on research projects, teaching and research achievements, patents, media reports on faculty and staff members, web sites about teaching and research activities carried out by faculty and staff members, and academic resource on the web related to research projects.

As we conducted our survey in order to suggest a metadata schema we found out that there were several differences in needs for the materials included. Most of the learning and teaching materials are digital-born; not published.

4.5 EXPANSION OF METADATA STANDARD SUPPORT

By examining the common experiences we have observed some gaps in the metadata infrastructure that need significant research and development within the institutional repository in general. The diversity of disciplines and formats of learning and teaching materials in institutional repositories, makes it difficult to use a curtain metadata format. As librarians we have to meet changes and shift to electronic versions of resources and develop more flexibility so that we can provide access to the materials that faculty members have and wish to share with others.

Chapman mentioned,

> Ideally, IRs should allow for the selection of an appropriate metadata schema and appropriate controlled vocabularies at the community or collection level,
> rather than having to shoehorn existing metadata and descriptive practices
> into a single Dublin Core (DC) schema. (Chapman, 2009)

Standard metadata schemas such as PREMIS, CEDARS etc. are widely supported and provide more detailed description than simple DC. By integrating these metadata standards into the IR environment, it might enable component ingestion of a broader variety of materials without having to write additional transformational programs. It would also allow IR community to adopt a metadata standard that better meet its needs and content.

In addition to provide extra options for descriptive metadata, IRs should sustain preservation, structural, and rights metadata. Current IR provides a limited amount of preservation metadata in the form of file type identification for each bitstream submitted. Chapman said,

> … preservation metadata enhances the library's ability to manage activities related to a digital item's format, authenticity, and stability over time. (Chapman, 2009)

The content of the materials also makes a difference in the subject field. Regarding a book, we can find authorized subject headings that generally cover the topical content of the item. In dealing with a student paper, we are challenged to deal with both the general and the very specific nature of the material and provide access related to the potential interest in the material.

Another issue is contributor in other word who the student's adviser was for their project or paper. We are using dc.contributor.advisor which harvests at the contributor aspect. Faculty will not want authorship of student papers to be inaccurately attributed to them and may well resist allowing student papers to be made widely available.

Authority control in institutional repositories is a common difficulty. It is vital to accurately identify the researchers who deposit their materials for preservation, access, and rights reasons. So IR managers should develop own methods in order to solve it.

Considering available materials in different faculty and departments, an extensive investigation has been done in accessible institutional repository. Based on those the following Qualified Dublin Core metadata fields have been suggested preserving of learning materials in the institutional repository in the appendix table 1.

Other than these, there are other fields that need to be either identified as separate field or merged with any mentioned fields (table 1) is required, for example for images Height, Width, Pixel, Materials used (Oil painting/water color painting/ceramic/ support surface/sand/clay/paper/ glass/wood /walls) and camera's description; course name, course number, course teacher's name. In addition, there should be accommodation of comprised multiple files, for example, a conference paper along with the overhead presentation delivered at the conference.

CHAPTER 5

CONCLUSION

This last chapter presents the key findings drawn from the interviews and document analysis. It focuses on the main issues learnt from the study by responding the research questions and summarizing the possible future research designs.

5.1 SUMMARY

This study adopts a qualitative research method, the data collection method consisted of semi-structured interviews and document analysis. Faculty members from different departments at HIOA were interviewed.

In The literature (reviewed in chapter 2) we find various metadata standards for implementation of digital preservation it has own future challenge in the aim of digital preservation. Many institutional repositories have adopted a mixed metadata strategies and standards, according to description by various workflows and preserving digital content.

The third chapter explained used methodology and data collection techniques and analysis tools, also limitations of the research. In the fourth chapter we tried to examine the results of the survey by interpretation and discussion the replies. And we examined the implementing standard preservation metadata and suggested additional metadata fields and elements into practice in response on the learning and teaching materials produced by HIOA faculty members.

5.2 ANSWER TO RESEARCH QUESTIONS

1. To what extent are faculty members interested in preservation of learning and teaching materials and what type of materials are the most important?

The overview of the survey indicates that faculty members have a broad number of varied non-peer-reviewed materials. Those materials are set up separately in their own way due to absence of any central pattern. They consider that a centralized system is necessary for sharing and simplifying access to the learning and teaching materials produced by them. In the digital age they are highly interested in preserving their materials and making them available all over the world.

The informants state that they use traditional formats of documents which are easily available with package software. At the same time, they have some materials different from the traditional ones.

They assume that preserving learning materials in the institutional repository can decrease the loss of them over time.

Various type of materials are using by the different faculties such are,

- dissertations for bachelor degrees,
- conference and symposium contributions,
- class notes,
- class lectures,
- audio or video of class lectures by internal or external teachers,
- class syllabi,
- statistical data,
- information on research projects,
- media reports on faculty and staff members,
- web sites about teaching and research activities carried out by faculty and staff members,
- academic resource on the web related to research projects etc.

2. Which additional metadata schema or elements can be suitable for effective description of learning and teaching materials?

We identify and analyze the different metadata models in a sample of the found documents types and try to extend metadata schemas for educational materials concentrating on the metadata standard such as OAI-PMH, PREMIS and suggest the specific metadata elements used to describe educational features (such as audience, contributor, type of educational material, learning objectives, etc.) in order to provide more detail about the resources.

5.3 RECOMMENDATIONS

To simplify content deposit and encourage faculty participation, the institutional repository should accommodate a wide range of document types popular with various academic

departments. The minimum required document types have been mentioned in the appendix table #2.

The repository should be able to accommodate a variety of digital file formats, including widely used formats. The minimum required formats have been mentioned in the appendix1 table # 3.

The institutional repository should offer a good number of metadata field as there are different types of need and description addressed by various departments. The fields that have been listed in the table # 3 should be seen as an example, and at the same time as a minimal requirement.

The use of standardized vocabularies and other encoding schemes that guarantee the consistency and quality of the records of a single repository should be a developed aspect of - higher educational institutional repository.

There are faculty members who normally create many non-peer reviewed learning and educational documents. They should be on board by initially targeting them and explaining the importance of the preservation of non-peer reviewed materials in the repository.

Starting with inputs of high profile individuals (senior professors) in the repository will find fast recognition among the others who matter as far as policy issues are concerned.

Provide training on how to preserve and use the repository.

It is becoming ever more important for libraries to provide the variety of contents and services that Institutional repository plays an important role in delivering. More and more users are taking advantage of what IRs have to offer.

5.4 FUTURE RESEARCH IDEAS

The results of this study cannot apply to the whole population of the HIOA academic authors due to the insufficient number of participants and issues raised in the questionnaire. However, these results can still indicate trends and approaches that can be further investigated in the future.

Institutional repositories are a relatively new activity for higher education institutions. The development of repositories follows the development of the information technology field. However, when institutions want to expand and develop the content of the faculty of their institution or the faculty in the discipline, they encounter a number of problems. Beyond collection development and qualified metadata schema issues which we tried to cover in this study there are also several challenges that should be investigated in the future.

As this study considers HIOA, it would be interesting to conduct further research incorporating more educational institutions and all other kinds of institutions engaged in digital preservation.

This study has reviewed different preservation metadata standards/schema to record metadata elements as well as developed its own metadata specifications. It would be stimulating to investigate the cooperation level and its need between different educational institutions for the development of better specification that can cover a wide range of standards and formats. It would also be interesting to study the comparison and adaptation of various metadata specifications.

It may also be interesting to involve experts opinion. Particularly archivists' advice would be valuable for further development of the research. As HIOA is governmental university, digitalizing and determining of the archival content is an important aspect. Besides learning and teaching materials preservation of the administrative documents also is required.

Due to time limitation we could not touch upon further problems for developing repository at HIOA. One of the problems that need to be addressed is the challenge of disentangling copyright permissions.

Further research with a more purposely selected above shown samples will be needed to provide more comprehensive conclusions of motivation.

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APPENDIXES

Table 1 Metadata fields

Qualified Dublin core	Metadata Fields	Remarks
dc. contributor. advisor	Contributors	Use primarily for thesis advisor.
	Name of guest lecturer	
	Creator for video	
dc. coverage. spatial	Spatial	Spatial characteristics of content.
dc. date.accessioned	Accession	Date DSpace takes possession of item.
dc.date.available	Available	Date or date range item became available to the public.
dc.date.issued	Issued	Date of publication or distribution.
dc.date.submitted	Submitted	Recommend for theses/dissertations.
dc.identifier.uri/fulltext	URI/Handle/fulltext	http://hdl.handle.net/10361/621
dc.identifier.other	Other	A known identifier type common to a local collection.
dc.description	Description	
dc.description.provenance	Provenance	The history of custody of the item since its creation, including any changes successive custodians made to it.
dc.description.version	Version	Pre-print/post-print/new version number
dc.description.sponsorship	Sponsor/funding body	Information about sponsoring agencies, individuals, or contractual arrangements for the item.
dc.identifier.citation	Citation	Bibliographic citation for works that have been published as a part of a larger work, e.g. journal articles, book chapters.
dc.language.iso	Language	En/No etc
dc.type	Type of document	Book chapter/conference presentation/class note/
dc.type.publicationtype	Type of publication	Refereed published journal paper
dc.publisher.faculty	Faculty	Name of Faculty
dc.publisher.department	Department	Name of

Qualified Dublin core	Metadata Fields	Remarks
dc.subject	Subject Heading	Controlled vocabulary/keywords
dc.format.mimetype	mimetype	MIME (Multipurpose Internet Mail Extensions) type identifiers.
dc.format.extent	Extent	Size or duration
dc.format.medium	Medium	Physical medium
dc.relation. haspart	haspart	References physically or logically contained item

Table 2: Types of documents

	Document types	Remarks
1.	Class lectures, Class notes, additional notes to clarify textbooks, instructor's notes, Course related documents (any)	Internal or guest lecturers
2.	Course syllabi, handouts	
3.	Abstracts, notes, outlines, remarks	
4.	Institution's/faculty/department's course catalogs	
5.	Conference presentation and stream, Symposium contributions	
6.	Exercise or assignments for students	Internal or guest lecturers
7.	Assignments prepared by teaching assistants, or students	
8.	Capture picture of ceramic art	
9.	Images	Related to research
10.	Images or Photographs	Related to exhibition/made by students or faculty members
11.	Newspapers images	Journalism
12.	Video stream	Internal or guest lecturers
13.	Audio taped lectures	Internal or guest lecturers
14.	Non-reviewed articles	Internal or guest lecturers

	Document types	Remarks
15.	Interim and/or final reports to funding agencies	
16.	Interview transcripts/Questionnaires	Research students
17.	Sound recordings of interview transcripts	Research students
18.	Models, software demonstration files	
19.	Unpublished results from research projects undergraduate/graduate/PhD student)	Close access and shared between concerned personnel only
20.	Thesis or projects prepared by undergraduate students	
21.	Software	Open source and made by HIOA as part of project or bachelor thesis
22.	Software documentation	
23.	Pre- prints of articles	
24.	Working papers	
25.	Institution's/faculty/department's alumni publications	
26.	Media reports on faculty and staff members	
27.	Web sites about teaching and research activities carried out by faculty and staff members	

Table 3: file format

	Description	Extensions
1.	Microsoft Word	doc
2.	Adobe PDF	pdf
3.	SGML	sgm, sgml
4.	Microsoft Excel	xls
5.	Microsoft Powerpoint	ppt
6.	Microsoft Project	mpp, mpx, mpd
7.	Microsoft Visio	vsd
8.	Photoshop	psd, pdd

	Description	Extensions
9.	audio/basic	au, snd
10.	MPEG Audio	mpa, abs, mpeg
11.	RealAudio	ra, ram
12.	WAV	wav
13.	GIF	gif
14.	JPEG	jpeg, jpg
15.	PNG	png
16.	TIFF	tiff, tif
17.	BMP	bmp
18.	HTML	html, htm
19.	Text	txt
20.	Rich Text Format	rtf
21.	XML	xml
22.	MPEG	mpeg, mpg, mpe
23.	SPSS Syntax File	sps
24.	SPSS system file	sav
25.	SPSS portable file	por
26.	Comma separated values	csv
27.	Tab separated values	tab

APPENDIX 2
Face-to-face interview

Respondent # 1

1. **What kinds of materials do you like to keep and share in institutional repository? For example, non-peer reviewed articles, class lectures /notes/presentation etc**

My lecture, presentations, open to use probably given presentations in conferences in Norway which out of available could be interesting. Today I posted on my page I have my own webpage, to have been in system whatever stored, preserved in the same page sounds be good idea. Ter giving lecture sometimes students want to have access again.

Supplementary question: What do you think about geust lecturers?

I think so but ups to guest lecturers, if guest lecturers hoped so it should be there how content should be used, agree with lecturer, I think this will be very good for my course I can ask lecturer can I put it on internet I think it is important to agree how should be used could be question here license how could be used the content favorable something can be changed, adapted… on perhaps properly system create a ….. and license thing

Supplementary question: Do you interested to put thess files in IR?

Not sure how to be in such situation difficult for me to decide I think raw data is when we give a lecture you take a note, write and compile a data to present to us why they selected that data? What the method to use collected data? you need all that in contents, what data to value or in more just value to be used wrong way in … data we know which sort of how they selected …. So can I turn raw data into context I think I think personally complicated the situation to put the data documents, presentations, audios, videos, be available is quite natural should be.. .If it is not published anywhere we can not allow to others to use this raw data. For preservation you need university give you a place where to put

I think you talked about collecting data … unpublished data the can use the like sharing data more complicated, but for preservation I think …this is more issues data like documents how long should be stored what purposes should stored for a long time who can use the data just student, and when the project is finished I believe the scenario take… with data we think the system … special design to store the data .. also I think the system describing here may using some program here in the local network of High school

2. **What kinds of materials do you like to preserve for long time or for archival**

preservation?

Not really sure… lecture notes most value to share with students go back 3 years the syllabus differences is not big just small difference conference I think should be kept I think this well lecture should be kept. So would be interesting in 20 years go back to see also the teaching .. great results with somebody studying changing in studies it would be interesting

Also discussed at the beginning knowledge management if professor retired new teacher is interested in how he taught the course? Of course one of the course I teach I save my lecture note on the web open for everybody my web server, and my colleagues can see different years go back, I started to take the notes of lectures adapted them and continue. I think the way we working, teaching technical courses and we think very much that they probably not have the material in different period to compare so more organized system is perfect I think it is important.. to share because you don't have ..

Supplementary question: Is there any unique materials in your faculty/department than others?

Software could be .. This will be open access so anybody can use download it? You have some kind of license or everybody can use? I don't have today ... several programs, thay are nt open to use today, but would be interesting for the scholars formal knowledge again is issue.. software is creating setting .. could be open knowledge for who could be interested in this systems. I have no problem with that but this is license question I would like some license to use my program.. I think for me why I have internet today we can publish software in repository needs quite a lot of work which would be used by others documentation

I think the situation what I can see in Dropbox we have document for share before that published use together with others before publishing can be share with others that's more collaborative software, software can be used for work together. So I think about it seems like to be you want to protect data, use it in one place people can work together on documents I think it should be open

Supplementary question: What kind of file format you usually use like pdf, doc, html, powerpoint?

I have published in pdf, power point, I use google docs, I already used jpeg for my own page so html, pdf what I published by myself. for me I don't use ms word but my collogues use them that before publishing I don't believe for publishing they use word publishing should be html or pdf

3. What kind of descriptions would you like to see in user interface or when it is presented to you?

What you think full text such thing author…Yeah .. Subject.. perhaps you said such documents format just pdf so is quite traditional I can think about special sort of metadata which written number also format what language I think it is quite what aspects documents have … for searching sorting

4. What kind of policy like access, uses, etc do you like to have in the repository? for example Open or close access?

I think it should be open access for everybody in the world can use this and could be KM for organization keeps its knowledge … I think if you have right you have graded very gradual like system it could how ... for me personally my lectures I want to use everybody to see everybody, see I am clever …we have system Fronter learning system that is closed I can post there my lecture a lot of my collegues just use Frontier so if we have the same protection like in Frontier I think it is possible if you have quite rules, rights, creative comments of publishing .. I think very complicated

5. What kind of measures should be taken by the OUC for the promotion of this institutional repository?

I think none can force them to use it but if you say he/she has to use it yourself which right .. you put documents .. we say you got published your document here you can publish your lecture notes what we can say only here my colleagues can use them so I think that is very important yes she can publish them here everybody can use them .. might be interested in usage

So you think in this way IR will be promoted faculty member can be interested to put their material by themselves? Not sure... but for me it is important you said knowledge management I think KM can say that I am created knowledge here myself you pay 10 years me work here when I go … so they can tell we want you each faculty member should present

notes in the system I think if they understand the faculty members could limit how to use if just use for colleague or spread wider that should be complies

Respondent # 2

1. **What kinds of materials do you like to keep and share in institutional repository? For example, non-peer reviewed articles, class lectures /notes/presentation etc**

Well… there are lots of materials I believe but we already published many of them on the web, so it is already there. Do not of course organized, we teach courses, the course materials are published on course pages on the web, some teachers uses the system frontiers, you know the frontiers, frontiers is a close system, how admission, most of us make materials and want whole world can read it so we publish it on web. But for causes people from other branches of this university, from other universities in Norway or also abroad won't find it because these are not organized they can search the Google and find it among various others type of materials and subjects but not in organized way. So it may a good thing to have a place here …. college to to where conceive all that kind of materials in one place, so what we publish its lecture notes, some ……. Most of us have an a mostly English text books, but publish lecture notes in addition to that, because we in our lessons we make note then we teach and publish on on the webpages, so and we of course make hours to exercise to publish there and also when we want to clarify materials on the text book that is students are feel very difficult to understand then we often make additional notes to make it clear and of course and most students like notes of course in Norwegian but almost every textbook we have is in English so I think that would be a good thing to publish materials that are in scatter ways.

Supplementary question: What do you think about bachelor thesis, conference proceeding, non-peer-reviewed articles, presentation (video or audio) of guest lecturers for this institutional repository, and sharing the same with other colleagues or other departments?

Hmmm It is difficult question, and I do not thing we have so much materials of that many kinds, a guest lecturers for instance will be will not cannot be read it alone we will read with rest of the course, so I don t know an isolate guest lectures will be in interested or not,…. because all these lectures are part of ongoing course so it should be read together with other materials.

Supplementary question: What do you think about raw data, questionnaire, audio or video sharing between research supervisor and students using the same institutional repository before publishing the research?

Hmmm……. Well I am I do not think I have raw data but students are doing in their projects and they keep them for their service. But we already published the bachelor projects that students do that we already do because here the students has to finish their three years course with the bachelor projects and we are publish that on internet on web for many many years and that's good probably be organized and common pass probably for whole college so because this institute.. institute for information technology we have own system for publishing it and other have their own system may be not have any system at all and if if the the whole college could have a common system that would be nice. But then there would be one problem because many of our bachelor projects are with we collaborate with industries and quite often sometimes the industries said no we cannot publish it because it contains secrets so we can have a paper copy and we cannot publish it on net but that's common that most most bachelor projects cannot be publish.

That must be considering ……. The students have copyright that's their projects and that have an agreement with us and the institutions can get the copyright

2. What kinds of materials do you like to preserve for long time or for archival preservation?

I do not know really because …….. we have peer reviewed materials of course that could be kept for such long period but we already have an system for that …..but well teaching materials does not last as long as like 10 years specially within computer science where I work materials are five years or too old and we need to renew our materials every second years so

I think OUC have an system …….I think the front of each course is same but have separate pages that what is going on in each semester so you can go back and see what were the course in last five years, teachers change so but probably be a good idea. Very often when a student take part in a course and that course is part of another education then they have to verified what was the course five years ago and that lost, then the system you suggest is very useful.

Supplementary question: Is there any unique materials in your faculty/department than others?

No no, I think we publish in either in html or in PDF by law we cannot publish in word. Well not in my department there is common open source so its policy here to use open source as much as possible. In case of software developed in here that would be possible. The bachelor projects made by students here very very often contain software ……. and probably be interest on other parts so ……. but I don't think ……I do not know anyone here in my department made some use of these type of software that would be interest by others I do not know.

3. **What kind of descriptions would you like to see in user interface or when it is presented to you?**

Well that is difficult question to answer before I see the interface. I do not think of any other than traditional but for example course note could be ordinary that have in the library I do not think any other thinks should be there.

4. **What kind of policy like access, uses, etc do you like to have in the repository? for example Open or close access?**

It should be open as possible ….. we publish now on internet that is open to everybody most of us put copyright information at the bottom like creative common I do not think there should be any kind of restrictions it should also be searchable by google.

5. **What kind of measures should be taken by the HIOA for the promotion of this institutional repository?**

Well it should tell to all the other institutions and colleges then they might be interested in finding teaching materials then of course student in that institution will also have access too so … but I do not think the materials there will be of great interest on any parts outside of university and college world. Most of us put our things on internet …… may be we will do both I mean publish in our own pages and we want as many as possible to read but it will depend how much it will use.

Respondent # 3

1. **What kinds of materials do you like to keep and share in institutional repository? For example, non-peer reviewed articles, class lectures /notes/presentation etc**

I would like to share first of all lecture notes and exercises for students. That's most important thing for me. I myself I do not write the proceeding, research articles and such things. So, that is not important for me. For syllabus, yes.

Supplementary question: DO you like to keep guest lecturers' materials in the IR?

Yes, yes, generally I like most possible openness. So I like to share as much as possible. I also like to know what others knew on the same.

2. **What kinds of materials do you like to preserve for long time or for archival preservation?**

I do not know. I think it's ..it's good to have it one place by maximum; much easier to find it; need not to search everywhere to find what you want to see.

Supplementary questions: Is there any unique materials in your faculty/department than others?

Most the most what I am very prominent organized in html, so I have my things open on internet. So everyone can see my lectures, notes open on internet. That is what I am very prominent. I don't write the word format. It's only html format and I like to have it in pdf.

Supplementary questions: how you consider the bachelor thesis should be in this institutional repository or not?

Ah I think, they should be there.

3. **What kind of descriptions would you like to see in user interface or when it is presented to you?**

No, I have not thought of that.

4. **What kind of policy like access, uses, etc do you like to have in the repository? for example Open or close access?**

I like open access to everything but for searching keyword it must be something that is relevant for that material for searching.

5. **What kind of measures should be taken by the HIOA for the promotion of this institutional repository?**

All, if there is no restriction from outside or given for study….. On the internet on some way, not beyond the net, not on paper or something, on the net.

Respondent # 4

1. **What kinds of materials do you like to keep and share in institutional repository? For example, non-peer reviewed articles, class lectures /notes/presentation etc**

Ceramics in manual that is students used to work it can be with pictures with text a lot of things and you can change it is not static it is in change but the teachers can input something by themselves it is not really available we don't have in the Frontier system exactly Frontier system but also I think is closed so all that sort of things it is power point presentations all kind of power point presentations because we do a lot of that so this kind of things

Supplementary question: Sometimes you go to conference; sometimes you have guest lecturers all over the world. They have video audio or power point presentation. Do you want to put them into IR?

I would like to do that.

Supplementary question: Maybe you want to see some lecture several years ago. Would you like to keep them in this IR?

Yes if it is a sort of videos of the lectures you know of course that will be great other thing also power point or some kind of written thesis whatever but now it is a theory with teachers because we have it in our offices so yes actually I think

Supplementary question: What document type you are using for your department?

I think power point and word document we have …. Sites, Yes for html documents … it can be another pdf I think we don't have as many video not much but I think that would come

Supplementary question: Do you have photographs?

Yes absolutely a lot of photographs a lot of images

Supplementary question: How do you preserve them?

Now I think it is mostly power point presentation that is present images it all word document so not published in images alone it is images you know in the context yeah I don't know more format

2. What kinds of materials do you like to preserve for long time or for archival preservation?

I think if you want to preserve for long time we have some kind of peer review because I don't think it can be up to teacher to decide what institution wants to have for a long time I think sort of build system that we have some sort of quality control what we want to save for long time I think this will have to be discussed because they never have be done before so something are used you know for one year but something can be used for many years and

different but I think if you want to use it for long term perhaps te some kind of quality check up by our institute it worth to be saved for a long time so..

Supplementary question: Do you think there should have quality control?

Yeah, it is important.

Supplementary question: What kind of materials would you like to keep for long time to see after 5 years it can be open or restricted access?

I think it is very difficult question to answer but I mean paper presentations should be a lot I think then manuals for teaching power point presentations they usually get outdate so I am not sure to say if after 5 years I can use the same probably not probably not so.. I am not sure actually I am thinking…

Supplementary question: would you like to see what you taught before 5 years in that course after 5 years?

Yes everything that you always .. I made power point presentation in one year in the next year I update it but I have a sort of original yeah… yeah. You post in Frontier but you want to see it again

Supplementary questions: Do you have some this kind of unique materials rather than other departments?

Yes, For each faculty each institute that they have something special.Yes maybe some faculty has software using by students but others they have only pdf. We have something databases actually but they are on the server special server here "tiva" I think that is special for us

3. What kind of descriptions would you like to see in user interface or when it is presented to you?

It should be I think.. how to say it in English what is course which courses belongs to .. they have to be used I think that is important .. other than that can you give me some examples for any.. Like video they need the creators and also who uploads this one like this kind of thing because video comes external systems.

Supplementary question: Do you think that bachelor students should share raw data with their professors through this IR?

I am not sure because I think maybe I have not thought about it because I think if you have group you do some research together with professor on your master thesis where you can see

the raw data I think you can upload it can be restricted access only for that group yeah maybe it would be a good idea because it would be easier to retrieve it later

4. **What kind of policy like access, uses, etc do you like to have in the repository? for example Open or close access?**

To have some open access some restricted because I mean to open for everyone to group to person maybe so to have different kind of level I think that it would be important I think that would be important to individuals I know that sometimes they have database they don't want to share with everybody that I know it is restricted by themselves or with collaborative people I think.

5. **What kind of measures should be taken by the HIOA for the promotion of this institutional repository?**

I think in our institution the difference can be with other different institution let's say out institution is Art and Design we would necessary to have different kind of materials than engineering institute so I think that maybe in our institute people can reserved can be reserved to share with but I think it will be take long time work because I think in one hand you want to hold on to control your own material but you again to share but I think it work in the institute it can be on the faculty but I think if institute would have to initiate kind of work to make it acceptable to do it but I think after have it institutional acceptable how to say to promote it marketing probably as a positive way of share knowledge so I think have to have different kind of levels for some institutes and at the whole institute should promote this very positive but I think you also have to start on the institute because I don't think …….. so institute faculty feel comfortable with sharing I think

Supplementary question: Do you to have any other suggestions for the institutional repository?

I think it is great idea we have talking about you know Norwegian system where we have peer review articles and that sorts in the system everything else that is made is … raw on each thesis computer so I think that if we can have system where to share it but with kind of peer review because we have to have quality I think that would be great and we need it very much.

Respondent # 5

1. **What kinds of materials do you like to keep and share in institutional repository? For example, non-peer reviewed articles, class lectures /notes/presentation etc**

We have cases here. Recently big, but, those teachers they were not digital. So everything disappears. This is not exactly what I was told that it was about. Because he told me that this would be about may be images. You see. Well, my lectures, I lecture quite a bit. But materials from those lectures are not a lot in writing, see just small words for the mind to catch and then u know i teach visual staff. I teach about the images, and composition and history and all those things. So a lot of all those things I present they are published material, that in a way I can defend to show them to student but strictly it's not legal to store these things because of rights, copyrights and the things also I am not allowed to make deposit of those materials I cannot deposit on any policy, because they are not mine.

These are not yours but you are using it as a part of your class lecture. So You are also admitting that Ok this is copyrighted, this people has owned this photograph this image. And you say when you go to class you said i think you say like this Ok this is copyrighted. The same thing for the preservation purpose you can keep and you can say Ok this is (NO, I can't) from that people, this people own this one but for my this course purpose this things are here.

(NO, I can't), I think it answer your question. In my field, the copyright issue is the main obstacle, and infact, the way I interpret the legislation on this field, I am not allowed to make any achieve of those things, you see.

Supplementary question: How are you giving these things to your student?

I am showing them because there is a lot on the internet for support which.. .

But, but, you see we had some meeting with people from top level of OUC some years ago and we were informed about what kind of legislation are we under in this matter and we are not allowed to do almost anything, and even includes news paper pages. you know. Every teacher here showed student newspaper pages because that's what it is all about. And of course if you should be strict, you should ask permission from the newspaper every time you show a newspaper page. You see. But that's not very practical.

Supplementary question: But, the thing is that you are using it for class lecture, teaching people.

Yaah we do that. But strictly speaking showing a newspaper page it's a kind of publishing it, and so you are not allowed to do that. Strictly speaking, but in practice, we do it in a way. So but to put it in a store magazines inside the internet or web at OUC, I don't think we can do that, but that would be very interesting to have that sort it out.

Supplementary question: What do you think, If OUC give you the same space and keep it as a close access?

I think, if you put it like that so the newspaper pages, it would be more you could think about that. Because if you have ability to control access and restricted within certain parts of the OUC, I think may be. It will require some seniors/signals from people know about laws and this things. From top of the OUC so it would have to sorted out in a way. In this situation when it is not sorted out I think don't think anyone would go for that.

So if it is close access, only two or three people can use it and it is totally restricted and only for educational purposes then I think it is Ok.other than open access. May be. may be I don't know. But I think it is now everybody is little bit careful because it is a grey area.

2. What kinds of materials do you like to preserve for long time or for archival preservation?

We have this this ..... an assistant professor who used to teach ethics, when he left he left behind lot of materials paper, old news paper pages so in physical condition, he did like that and he left a lot but it history you know it is important history it is about ethics and different cases from may be 10 , 20, 30 years back in time and so and so. So these things should be in such a place. And of course every time I teach new case like 22 July I think it may be those newspaper pages would be in such a place I think lots of teachers have collected such pages and that could be interest to have easy access and reality and really now lots of things are accessible and if u have page date and newspaper and it will be much more easier accessible of course if those things are in a same place.

Supplementary question: Do you have any format other than traditional format?

Newspaper pages in PDF and JPEG, no other format than traditional format for me. I have couple of reports that could be nice to put in such a place, yeah then again for power point presentation then you mainly touched the grey areas.

3. What kind of descriptions would you like to see in user interface or when it is

presented to you?

No I cannot….. I do not know……. but anything ……..but usually area keywords and sub divisional ethics, you can have subject classification but you can do it with keywords I think it would be better if it is done in professional way in another interface and then for our institute it would be best to sort it out according to curriculum or according to the organisation of different subject that we have. So you will have an ethics and different part of that if you combined such organization

4. **What kind of policy like access, use etc do you like to have in the repository? eg. Open or close access? (**Already answered in the beginning)

5. **What kind of measures should be taken by the HIOA for the promotion of this institutional repository?**

You mean promotion, I have not think about that……what could be the benefit of one of us…..also the benefit of organization…..that's difficult really …because for most teachers for the contributors, I think maybe you would not have a lot of benefits but some you might have you would increase materials accessible by yourselves so … I think may be you have to required different way of thinking but I am not sure about this things but we have to think this way for our materials at basic level and you could also think about sharing files of course and database or relevant literature would be do endnote for example, I think these are benefit, I think people need to be convince at first stage. I think the crucial area for our photojournalism program it is difficult thing about pictures, there is a knowledge factors and that students works because they produce a lot of works images also.

not only thesis at the end of the study but through the study in different parts of the thesis, of course may be to have an signed released at the beginning of the course or may be as a whole program is exciting is accessible at least for tour program and for our institute and we need to asked student each time to use their materials. It is good idea to have them all together, but this is also a grey area.

We are photojournalist, so we in addition to thesis and such things, we do record artist as part of the study and they do a lot of things that are relevant and interesting to use in other connections and I think that could be an ID to try to have this systemize and to have that student work in the database accessible for us that could be a record for history and then you could go back and see to identify what students produce in 2005 and so on it could be nice we

collected some of them but not in systematic way and I think that would be much more realistic.. I think we have to asked student each time to use works and that is again grey area.

Respondent # 6 & 7

1. **What kinds of materials do you like to keep and share in institutional repository? For example, non-peer reviewed articles, class lectures /notes/presentation etc**

It would be PowerPoint presentation, PDF, even documentation of students activities, like syllabus, course curriculum. our students like they do exhibitions, and rest of the class program, but we don't have documentation on this. So that would be main focus for me. It would be images and a little bit of text in some, may be of, probably of PDF. I want to install access to student's exhibitions to help the activities or in master level. ….. PDF and images are very traditional format. Other than these, video and sounds.

Supplementary question: What about the non-peer reviewed articles?

No, that does not apply to me. …….. but, I am sure, some colleague would have, may be, more like popular . No that's not so important for me.

Supplementary question: Do you also like to keep class lectures and conference proceeding /materials there?

Conference materials, yeah that might be

Supplementary question: Do you like to keep class lectures and conference proceedings/ materials there?

Conference materials, yeah that could be something. But the main thing is, I am not sure I would keep class lecture at such, because the class lecture I want to share I keep in the frontier. So, that's more or less enough.

Supplementary question: Do you like to keep your syllabuses there also?

AA….I could do this, but I think this to develop my teaching more or less. Keeping copies myself. So, I don't know, are you thinking that you would want to have this more shared repository to be open for research and this kind of? Some materials you can make it open, you can share with whole world or may be with some of you or you can restrict. You can define yourself. Yeah , because I think it is a different. This is sort of as a kind of research tool or

even a kind of communication tool with the upfront or if it is only to you know to keep……

Supplementary question: Do you like to keep guest lecturers videos or audios to reuse it in the next year?

To keep it for reference, hmm, it would be nice. Yeah.

Supplementary question: What you are doing now-a-days, as there is no institutional repositories like this?

Incase most of the time, I don't document it. The thing, that I have documented, I have checked out for myself, or I kept by myself. And sometimes, the PowerPoint presentations we keep and also make it accessible in frontier to student.

Supplementary question: So only you know where the location of that file is.

I have the digital material, if I have something that is really important, big project, this material I have kept but. This is, I am not, I cannot publish these materials because this is between me and the guest lecturer. It is not something to publish. So, this I just keep in my own computer.

Supplementary question: I think your way of publishing is different than other department.

Not mine, but those because I am not an artist, I am not making these images. But, I am traditional and try to get this work with articles. …….system. But I have more that education, just academic theoretical only. So, and ..as the system is known that is referee articles are kept in this point. I feel that when first are writing you are in a way forced to thinking that way. So I think that will be my way not to make an article that should be good enough to not refereed. Then little waste of time in this terrible system it can become. But I really think it's important to this kind of work that my colleagues have with images and text that reflect upon what they make and shown through below photos.

Supplementary question: Is there any unique materials in your faculty or department than others?

Yeah.

Supplementary question: What those are? We are interested about those.

That will be artistic materials or documentation of artistic materials. Processes and photo finished work I guess.

Supplementary question: How you are preserving those things?

They are preserved by the artists themselves. And, of course, these kind of material have their own publishing system that outside of the educational system in the art field. So, you know it's something is may be created by somebody who teaches here but publishing vehicle is more or less a gallery, In the gallery, things just laid there, somebody may be write something about this, it go somewhere else, so it's a life outside the educational institution. So I think for the institution, it could may be the interesting to keep material but I think for each individual artist probably don't feel the dignies because this material is taking care of in another ways but for the institution to know what is being produced this may be interesting I think. And to show the other competitive because this way of keeping material it hide from this institution, it's not serviceable .

Supplementary question: is there any central depository or any system working for your department?

For deposit material, no.

2. **What kinds of materials do you like to preserve for long time or for archival preservation?**

I think the idea with non refereed materials is very interesting for this faculty, because, so many are working with images, videos and antiques and it also problems that distance considering taking artistic research. Artistic research does not fit into this refereed system and give point. So, we have been looking for, thinking about how can this thing published and appreciated by others and that is also the colleagues not only the students it's in mentioned. So, that I think would be the most important for many of the other things, I think it's difficult to answer because ……this PowerPoint that many of the guest lecturer give some think to put in frontier for this group of student and some of them may be will think different using the PPT in broader because when me too, when I put my PPT and give it to my student, I don't like to put it in frontier, I print it. And give it to them. Because, it's not working with the process all the time. I don't think I will be interested in having files from 2005 until today because it's a kind of work that you do on the time, and it differs. And, for example, today I had a lecture in visual culture and looking what I did last time and I was not shocked but I

think I am glad it's not, what I did was enough but I mean it's changing all the time, I am also using from private photos, something so. Yeah, but, this things from conferences could be good way to sharing may be digitally with faculty because they often said that it's too little discussion about what did we , which conference we go to represent paper, just paper .. would be a good communication I think.

3. **What kind of descriptions would you like to see in user interface or when it is presented to you?**

Of course it would be nice if we have different types like theoretical complex, it could be materials, it could be titles of art works as well as articles from books.

Supplementary question: what kinds of fields should be there so you can retrieve your required document very quickly as a user.

As a user it's the same. But I would like to have you know tags.

Supplementary question: Are you are talking about the user tag or social tagging?

I am thinking that the one who publishes material should control the tagging or that it is the keyword, some kind of search system that is put up by the one who contribute material and when I want to find to see I wonder if somebody is working with relational statics/ topics here then I would like to be able to put such keyword somewhere and press search and get all the people that had tag their work with same. So, normal search function. I think that's enough for me. Some additional fields like what kinds of colours, materials, size, pixels should we input this kind of metadata also for artistic materials size, then it would be the artist could decide if it would be important or not.

4. **What kind of policy like access, use etc do you like to have in the repository? eg. Open or close access?**

if it is discussion, if it is something that just interesting for department may be closed other things could be open. I think so too. The variation will be good and that may be what should be open will be felt us quite more representative after we finished work but in other context it will be interesting may be publish something that is not yet finished on that. May be you collaborate on something and want to develop it. If you could keep something and when you are working for instance for a while before it was published that would be a very good function.

5. What kind of measures should be taken by the HIOA for the promotion of this institutional repository?

Hmm. That's a very good question I think. It's a difficult one. For the first, I think the argumentation we have made that we don't have an arena like this for this combination visually, images and text. It would be good one for the faculty members that are entertaining …… the possibility to also produce to a backward function may be. If you have images on your laptop. So I think the argument about security that would work on me. It's an option for the repository to make a small presentation of each member like a profile. So, if somebody searches from the outside they will find a better profile because now you probably know that profiles they get from the websites earlier very bad. Usually use room number from the keycard……so that's very uninteresting to most. It would be much more interesting to get a nicer profile with more information and with may be a link to whatever you wanted to keep open like art works or even yeah you could make links to all the encrypting until …. possible. I think that would also work. that was a good profile to connect to link.

Do you have any other suggestion?

Well it should tell to all the other institutions and colleges then they might be interested in finding teaching materials then of course student in that institution will also have access too so … but I do not think the materials there will be of great interest on any parts outside of university and college world. Most of us put our things on internet …… may be we will do both I mean publish in our own pages and we want as many as possible to read but it will depend how much it will use.

APPENDIX 3

	Response Percent	Response Count
Art	**28.6%**	**2**
Craft	14.3%	1

Drama	0.0%	0
Media	**28.6%**	**2**
Music	**28.6%**	**2**
Other	14.3%	1
	Other (If any)	1

2. What kinds of teaching and learning materials would you like to preserve and share in the institutional repository? (Please choose as many as you think appropriate)

	answered question	**6**
	skipped question	**1**
	Response Percent	Response Count
Class lectures, Class notes, instructor's notes,	33.3%	2
Additional notes to clarify textbooks,	0.0%	0
Course related documents	66.7%	4
Course syllabi, handouts	33.3%	2

2. What kinds of teaching and learning materials would you like to preserve and share in the institutional repository? (Please choose as many as you think appropriate)		
Abstracts, notes, outlines, remarks	50.0%	3
Institution's/faculty/department's course catalogs	16.7%	1
Conference presentation and stream, Symposium contributions	50.0%	3
Exercise or assignments for students	33.3%	2
Assignments prepared by teaching assistants, or students	16.7%	1
Capture picture of ceramic art	0.0%	0
Images	50.0%	3
Images or Photographs	50.0%	3
Newspapers images	33.3%	2
Video stream	**83.3%**	**5**
Audio taped lectures	16.7%	1
Non-reviewed articles	33.3%	2
Interim and/or final reports to funding agencies	0.0%	0
Interview transcripts/Questionnaires	16.7%	1

2. What kinds of teaching and learning materials would you like to preserve and share in the institutional repository? (Please choose as many as you think appropriate)		
Sound recordings of interview transcripts	16.7%	1
Models, software demonstration files	0.0%	0
Unpublished results from research projects undergraduate/graduate/PhD student)	16.7%	1
Thesis or projects prepared by undergraduate students	50.0%	3
Software	16.7%	1
Software documentation	0.0%	0
Pre- prints of articles	0.0%	0
Working papers	16.7%	1
Institution's/faculty/department's alumni publications	33.3%	2
Media reports on faculty and staff members	33.3%	2
Web sites about teaching and research activities carried out by faculty and staff members	66.7%	4
	Other (If any)	0

3. What kinds of teaching and learning materials would you like to preserve for short or long time preservation? Here short time preservation means digital materials will remain accessible and usable for a defined period of time, long preservation means digital materials will remain accessible and usable for over the long and indifened period. (Please choose as many as you think appropriate)

	answered question	**5**
	skipped question	**2**
	Response Percent	Response Count
Class lectures, Class notes, instructor's notes,	60.0%	3
Additional notes to clarify textbooks,	20.0%	1
Course related documents	**100.0%**	**5**
Course syllabi, handouts	60.0%	3
Abstracts, notes, outlines, remarks	40.0%	2
Institution's/faculty/department's course catalogs	20.0%	1
Conference presentation and stream, Symposium contributions	80.0%	4

3. What kinds of teaching and learning materials would you like to preserve for short or long time preservation? Here short time preservation means digital materials will remain accessible and usable for a defined period of time, long preservation means digital materials will remain accessible and usable for over the long and indifened period. (Please choose as many as you think appropriate)		
Exercise or assignments for students	80.0%	4
Assignments prepared by teaching assistants, or students	40.0%	2
Capture picture of ceramic art	0.0%	0
Images	60.0%	3
Images or Photographs	60.0%	3
Newspapers images	40.0%	2
Video stream	**100.0%**	**5**
Audio taped lectures	60.0%	3
Non-reviewed articles	40.0%	2
Interim and/or final reports to funding agencies	0.0%	0
Interview transcripts/Questionnaires	20.0%	1
Sound recordings of interview transcripts	20.0%	1
Models, software demonstration files	0.0%	0
Unpublished results from research projects undergraduate/graduate/PhD	40.0%	2

3. What kinds of teaching and learning materials would you like to preserve for short or long time preservation? Here short time preservation means digital materials will remain accessible and usable for a defined period of time, long preservation means digital materials will remain accessible and usable for over the long and indifened period. (Please choose as many as you think appropriate)

student)		
Thesis or projects prepared by undergraduate students	60.0%	3
Software	20.0%	1
Software documentation	0.0%	0
Pre- prints of articles	20.0%	1
Working papers	20.0%	1
Institution's/faculty/department's alumni publications	40.0%	2
Media reports on faculty and staff members	40.0%	2
Web sites about teaching and research activities carried out by faculty and staff members	60.0%	3
	Other (If any)	0

4. When describing a typical material in the user interface of the archive: what describing elements do you think are most important? (Please rate as you think appropriate)

4. When describing a typical material in the user interface of the archive: what describing elements do you think are most important? (Please rate as you think appropriate)

					answered question		**5**
					skipped question		**2**
	Very Important	Important	Less Important	Not Important	N/A	Rating Average	Response Count
Creator (Person or organisation primarily responsible for making the resource. - yourself)	**80.0% (4)**	20.0% (1)	0.0% (0)	0.0% (0)	0.0% (0)	1.20	5
Date (A point or period associated with an event in the lifecycle of the resource.)	40.0% (2)	**60.0% (3)**	0.0% (0)	0.0% (0)	0.0% (0)	1.60	5
Description (An abstract, a table of contents, or a free-text account of the resource.)	**60.0% (3)**	40.0% (2)	0.0% (0)	0.0% (0)	0.0% (0)	1.40	5

4. When describing a typical material in the user interface of the archive: what describing elements do you think are most important? (Please rate as you think appropriate)							
Format (The file format,or dimensions of the resource.)	20.0% (1)	**40.0% (2)**	**40.0% (2)**	0.0% (0)	0.0% (0)	2.20	5
Language (A language of the resource.)	20.0% (1)	**60.0% (3)**	0.0% (0)	0.0% (0)	20.0% (1)	1.75	5
Publisher (An entity responsible for making the resource available.)	**60.0% (3)**	40.0% (2)	0.0% (0)	0.0% (0)	0.0% (0)	1.40	5
Rights (Information about rights held in and over the resource.)	**40.0% (2)**	**40.0% (2)**	20.0% (1)	0.0% (0)	0.0% (0)	1.80	5
Source (A related resource from which the described resource is derived.)	20.0% (1)	**60.0% (3)**	20.0% (1)	0.0% (0)	0.0% (0)	2.00	5
Subject (The topic of the resource.)	**80.0% (4)**	20.0% (1)	0.0% (0)	0.0% (0)	0.0% (0)	1.20	5
Title	**60.0% (3)**	40.0% (2)	0.0% (0)	0.0% (0)	0.0% (0)	1.40	5
					Others (if any)		0

5. What are the file format you usually use? (Please choose as many as you think appropriate)

	answered question	**5**
	skipped question	**2**
	Response Percent	Response Count
Microsoft Word	**100.0%**	**5**
Adobe PDF	**100.0%**	**5**
SGML	0.0%	0
Microsoft Excel	60.0%	3
Microsoft Powerpoint	**100.0%**	**5**
Microsoft Project	0.0%	0
Microsoft Visio	0.0%	0
Photoshop	60.0%	3
audio/basic	0.0%	0

5. What are the file format you usually use? (Please choose as many as you think appropriate)		
MPEG Audio	40.0%	2
RealAudio	20.0%	1
WAV	0.0%	0
GIF	20.0%	1
JPEG	60.0%	3
PNG	20.0%	1
TIFF	20.0%	1
BMP	0.0%	0
HTML	60.0%	3
Text	20.0%	1
Rich Text Format	0.0%	0
XML	0.0%	0
MPEG	40.0%	2
SPSS Syntax File	20.0%	1
SPSS system file	20.0%	1
SPSS portable file	0.0%	0

5. What are the file format you usually use? (Please choose as many as you think appropriate)		
Comma separated values	0.0%	0
Tab separated values	0.0%	0
	Others (if any)	0