



Flexible Learning
for
Open Education

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A Proposal to the William and Flora Hewlett Foundation

By
The Ontario College of Art & Design

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Public description of your project

Please provide a brief statement that best describes your proposed work.

This description will appear on our website and in our annual report. It can be no longer than 15 words.

Support OER community in meeting diverse learner needs thereby increasing OER impact and global adoption.

Proposal Summary

Give a brief summary of your proposed work using no more than 300 words. Please write this description in plain English (no jargon). Assume the people reading it are knowledgeable, but are not educators. Describe the purpose of the proposal, including its importance; the way you plan to achieve your aims; expected outcomes; and the way you will evaluate your success.

Learners learn differently. Research shows that learners learn best when the learning experience is personalized to individual needs. OER is an ideal learning environment to meet the diverse needs of learners, including learners with disabilities. The FLOE (Flexible Learning for Open Education) Project will support the OER community in providing a sustainable, integrated approach to accessible learning, addressing the needs of learners who currently face barriers. This approach will advance the strengths and values of open education and encourage pedagogical and technical innovation. At the same time the approach will support content portability, ease of updating, internationalization and localization, content reuse and repurposing, and more efficient and effective content discovery.

FLOE will develop an engaging outreach and awareness program for both the OER community and the accessibility community to encourage collaboration in meeting diverse learner needs. FLOE will enable learners to identify their specific learning needs, OER producers to create and label transformable content, and OER repositories or portals to match learning needs with suitable OER through a set of embeddable components and services to be integrated into OER initiatives. To address gaps in available OER, FLOE will create demand services that recruit the online community and alternative format services to provide resource alternatives that meet unmet learner needs. To support adoption in Africa, and other areas where mobile devices are more prevalent than internet access, FLOE will create the tools and services needed to deliver OER via audio-only, text messages and small screens found on popular cell phones. These same tools and services will support accessibility, adding a compelling motivation for OER adoption of inclusive design. FLOE will also work with mainstream Web developers to integrate individualized learning delivery into common tools such as Firefox. FLOE will assist the OER community in meeting the commitment to inclusive learning.

Proposal to Open Educational Resources Initiative
FLOE Project
Jutta Treviranus



Section 2. PROPOSAL NARRATIVE¹

Name of Organization: Ontario College of Art & Design

Program Unit within Organization (if appropriate): Inclusive Design Institute

A. Problem/Theory of Action

Learners learn differently. Learning outcomes research shows that learners learn best when the learning experience is personalized to their learning needs. Learning breakdown, drop out and lack of engagement in education occurs when students face barriers to learning, feel marginalized by the learning experience offered or feel that their personal learning needs are ignored.^{2 3} Digital content and digital delivery mechanisms can be harnessed to assist in addressing the diversity of learning needs – due to the potential mutability or plasticity of digital systems and content but more importantly due to the opportunity for collaboration, cumulative production and support for networked communities.⁴ These enable personalized learning experiences and a greater diversity of learning resources to address the broad range of learning needs.

Most countries, states and educational institutions have committed to provide equal access to education for students classified as being disabled.⁵ All educational institutions in the US are governed by policies that require that curriculum be accessible to learners recognized as having a disability. Many of these policies are currently based upon a somewhat restrictive definition of disability and accessibility. Accessibility in formal education in the US has become a large and complex framework focused on policy compliance and specialized service delivery. Students must qualify and resources must comply to a fixed binary notion of disability and accessibility – to constrain special service expenditures and to enable compliance monitoring and enforcement.

Currently most Open Education Resources (OERs) are not designed to be accessible for learners with disabilities,⁶ most OER producers or developers are not aware of how to create accessible OERs, and most OER delivery mechanisms (e.g., OER portals) present significant barriers to learners using alternative access systems. Consequently OERs do not meet legislative requirements in many countries and the OER initiative falls short of the commitment to inclusive education.

The formal accessibility framework has received a less than welcoming reaction from the OER community for a variety of reasons including:

- Accessibility is seen to constrain creativity and innovation in both technological and pedagogical approaches, it is seen to be counter to interactivity or more engaging learning experiences,
- OER creators are not aware of learners with the constrained set of qualifying disabilities among their user group,

¹ This proposal is licensed under Creative Commons Attribution 3.0 license (see appendix 5)

² http://www.pearsoned.com/pr_2009/pearson_personalizedlearning.pdf

³ <http://www.cast.org/teachingeverystudent/ideas/tes/chapter1.cfm>

⁴ Toward Digital Equity: Bridging the divide in education. New York, NY: Allyn & Bacon.

⁵ <http://www.un.org/en/documents/udhr/>

⁶ Rush, Sharron, Unpublished report conducted by Knowbility, commissioned by the William and Flora Hewlett Foundation, 2010.

- the OER movement is dependent on voluntary participation which tends to be less responsive to enforced standards, and
- the guidelines for complying are seen to be too complex and confusing and in some cases impossible to achieve.

The pervasive and well-entrenched accessibility framework and the reaction it has engendered in the OER community have acted as an impediment to adoption of OER as a curriculum alternative in many formal education systems which fear litigation or other consequences of non-compliance with accessibility policy. This situation is unfortunate as the fundamental principles and motivations of OER and Accessibility are well aligned (inclusion, respect for diversity, equal access, open access, freedom to share and refine, etc.). More importantly the reforms required to achieve the OER community's vision of learning and education are the same reforms required to achieve the ultimate goals of accessibility (reforms to DRM and IP, move to digital content and delivery, recognition of the diversity of learners, learner choice, recognition of alternative learning delivery models, focus on deep learning, inclusive education). The two communities should be strong allies but find themselves relegated to opposite sides of a number of policy and advocacy debates.

The traditional approach to addressing the challenge of OER accessibility would be to modify all OERs and OER sites to meet a fixed set of accessibility criteria such as the Web Content Accessibility Guidelines, WCAG 2.0.

However there are several problems with this approach.

- There are a vast number of OERs, many of which are not amenable to modifying to meet WCAG 2.0. The time and resources required to modify all of the resources would be prohibitive.
- This approach provides a one-size-fits-all solution and does not recognize the full diversity of learners. The retrofit may compromise the learning experience for many learners.
- The approach would restrict the types of technologies, technical advances and range of interactive experiences that can be used in creating OERs for fear of contravening the accessibility criteria.

More significantly this traditional digital resource accessibility approach and the underlying policies and services that are based on fixed, binary notions of disability and accessibility do not serve the needs of learners with disabilities. This approach and framing:

- excludes learners that do not fit the categories (notably, learners with disabilities have less degrees of freedom or flexibility to fit assigned classifications and are therefore more likely to “fall between the cracks”; in addition there are many learners who do not qualify as having a disability but would benefit from or need alternative learning experiences),
- treats learners with disabilities as a homogeneous group when they are in fact the most heterogeneous group of learners,
- classifies learners based on a single parameter, ignoring the multiplicity of needs and skills that affect learning,
- constrains the design of learning resources thereby giving less leeway to address minority needs and non-normative learning styles or approaches faced by people with disabilities, and
- compromise the learning experience for many of the learners the services are intended to serve (e.g., learners with learning disabilities who rely on visual learning).

The fixed binary definitions also encourage specialized, segregated services for people with disabilities (i.e., they serve to “ghettoize” education for students with disabilities). This makes these services less sustainable

(more vulnerable to funding cuts, open to the whims of shifting funding priorities, peripheral to mainstream efforts and investments, etc.) and more costly (duplicating services found in the mainstream)⁷.

We propose a relative framing of disability and accessibility recognizing the range of human diversity. All learners potentially face barriers to learning. Like barriers faced by people with disabilities these can be seen as a product of a mismatch between the needs of the learner and the learning experience and environment.

Learning needs that affect learning can include:

- sensory, motor, cognitive, emotional and social constraints,
- individual learning styles and approaches,
- linguistic or cultural preferences,
- technical, financial or environmental constraints.

Using this framing an accessible learning experience is a learning experience that matches the needs of the individual learner or the learners within a group. Thus a resource cannot be labeled as accessible or inaccessible until we know the context and the learner/s. This aligns well with OER best practices, learning outcomes research and evidence regarding good pedagogy in OER-based education.⁷ This framing merely adds an additional critical impetus to the broader goals and values of the OER community. The added push recognizes that some learners are more constrained than others and are therefore less able to adapt to the learning experience or environment offered, with the result that the learning environment or experience must be more flexible.

To achieve an accessible or inclusively designed OER system requires the capacity to match the learning needs of individual learners⁸. This requires OER resources that are amenable to reuse and a large, diverse pool of OERs. If the default OER is inaccessible to a specific learner the inclusively designed system would either:

- a) transform the resource (e.g., through styling mechanisms),
- b) augment the resource (e.g., by adding captioning to video), or
- c) replace the resource with another resource that addresses the same learning goals but matches the learner's specific access needs.

To achieve this requires:

1. information about each learner's access needs
2. information about the learner needs addressed by each resource
3. resources that are amenable to transformation, and a pool of alternative equivalent resources.
4. a method of matching learner needs with the appropriate learning experience

Programmatically deriving or soliciting this information and performing these functions must be embedded into the current and future OER infrastructure. Fortunately these steps are not foreign to the OER effort but can be seen as nudges to advance the OER agenda as a whole.

However this approach is helped by conceptual and practical adjustments in both the OER and Accessibility communities. The approach requires that the OER community:

⁷ <http://www2.ed.gov/inits/commissionsboards/whspecialeducation/reports/summ.html>

⁸ Treviranus, J. & Roberts, V. (2006), Inclusive E-learning in *International Handbook of Virtual Learning Environment*. Editors: Joel Weiss, Jason Nolan, Peter Trifonas, Kluwer, Springer, Hamburg.

- fully adopt and support the principles of cumulative authoring, derivative works, reuse and repurposing that is already a part of the OER mantra,
- improve learner-focused resource discovery and the prerequisite labeling,
- promote an authoring attitude that lets go of the tight control on a fixed presentation or rendering,
- invest further in a learner-centric approach to resource design,
- commit to support open interoperability standards for both file formats and programming/scripting environments,
- support open source tools with open APIs to enable interoperability with assistive technologies, and
- improve portability or device independence of resources.

The Accessibility community will need to:

- adjust the interpretation and implementation of accessibility legislation and policy to a learner-centric approach; notably this does not require that the letter or spirit of existing legislation be changed only the interpretation and implementation,
- recognize that OER is a viable alternative to the complex, confounding and deeply entrenched DRM conundrum that is consuming so much accessibility effort and passion,
- let go of the focus on equivalent content and focus on equivalent learning, and
- recognize that in the digital realm it is possible and effective to shift from a one-size-fits-all to a one-size-fits-one approach to providing accessible learning.

The proposed project will support this shift in both communities.

The FLOE (Flexible Learning for Open Education) project will leverage many years of work in Canada and internationally. The Connecting Canadians Initiative and the elearning program of Canarie supported a large body of research into learning object repositories (which can be said to be the precursors of Open Education Resources)⁹. Inclusive or accessible design was an important priority of this program. This led to the creation of a number of foundational technologies and practices to support inclusive online learning such as Web4All and AccessForAll. AccessForAll is both an open international interoperability standard and a number of open source implementations for matching learning resources and learning delivery systems to meet the individual needs of learners. AccessForAll has been implemented in projects and services such as TILE (The Inclusive Learning Exchange), TransformAble, ATutor, the Angel Learning Management System, EU4All, Teacher's Domain and the K12 Library¹⁰. These implementations have yielded a considerable body of evidence and research that have been used to refine both the standard and subsequent implementations. The project will also leverage deep, broad and diverse community networks that have formed around the goal of open inclusive learning. These communities intersect the open source, elearning, international development, social justice, minority cultures and accessibility efforts.

The proposed approach to accessibility is based on the notion of designing for diversity and as such brings with it a host of associated benefits related to diversity, flexibility and adaptability in several realms. In many cases these are powerful motivators for adopting inclusive design principles that may be invoked if and when accessibility is not seen as a critical priority. Even when accessibility is seen as a requirement, these associated benefits can be added motivators for applying inclusive design principles. These associated benefits include:

⁹ <http://www.cjlt.ca/index.php/cjlt/article/viewArticle/28/26>

¹⁰ Treviranus, J. & Roberts, V. (2007), "Disability, Special Education and IT" in *International Handbook of Information Technology in Primary and Secondary Education*. Editors: J.M. Voogt, G. Knezek. Springer, Hamburg.

- ease of internationalization and translation,
- OER portability across operating systems and browsers,
- ease of reuse, repurposing, and updating,
- improved discovery and selection of appropriate OER, and
- ease of delivery through a variety of mobile devices whether phones, smart phones, tablets or laptops.

The proposed project design recognizes the very distributed, unregulated, largely voluntary nature of the OER community. It has been argued that the most effective means of achieving accessibility goals is through the use of “the stick” in the form of legislation and the threat of litigation. However the “stick” is too blunt an instrument to properly address the complexities of learning and like its use in child rearing usually has unintended side effects (e.g., scarce time and energy devoted to developing creative means to bypass legislation or seek exemptions to legislation, rigidity in adhering to the letter of the law, suppressing innovation, legalistic application of the regulations that do not recognize the diversity or nuanced nature of learning needs) and does not in itself lead to systemic, long-term cultural change. The “stick” is also less effective in a voluntary community such as the OER community. The project will embed inclusive design in the day to day OER workflow making inclusive design largely automatic and unconscious wherever possible and providing the supports and decision making tools to enable efficient and effective inclusive design where human judgment and effort are required.

The project design also recognizes the complex, sometimes emotionally charged and highly political nature of the accessibility policy and compliance framework and is in tune with conceptual trends in the political, technical and advocacy efforts of this community. The approach has the support of the majority of thought leaders in the accessibility field but must be communicated to the policy framework.

Goals

The larger goals of the FLOE project are to:

1. Achieve OER community buy-in and sustainable support for accessible or inclusive design of OER.
2. Gather, modify or create the necessary inclusive design components, tools and processes to embed in and enhance existing OER communities, projects and processes to enable and support the creation and delivery of content that meets the full diversity of learner needs (and relevant accessibility policy).
3. Use the advantages of OER for accessibility as a lever for broader adoption of OER, especially in the K-12 domain.
4. Increase awareness of advantages of OER in the broader accessibility community and more specifically in the accessibility policy framework and accessibility advocacy field.
5. Capitalize on the confluence of inclusive design with design for portability and internationalization to encourage the OER community to adopt inclusive design practices.

B. Background

The project will be led by the Adaptive Technology Research Centre (ATRC) at the Ontario College of Art and Design. The ATRC is an internationally recognized centre of expertise in the inclusive design of emerging information and communication technologies established in 1994 by Jutta Treviranus at the University of Toronto. With more than 30 interdisciplinary researchers, the ATRC has pioneered broadly implemented building blocks for inclusive design of ICT in education. The ATRC has developed the necessary collaborative infrastructure needed to successfully coordinate large, broadly distributed, international research networks through projects such as Fluid, TILE (The Inclusive Learning Exchange), CulturAll, Decapod, ATutor, CNICE

(the Canadian Network for Inclusive Cultural Exchange), AEGIS and many others. All results of ATRC research are open source and open access. Many of the research results of the ATRC have been tested and implemented in large-scale education programs that require production level quality and reliability.

The infrastructure of the Inclusive Design Institute, led by Jutta Treviranus will be available to the project. This includes the necessary servers and applications needed to support large collaborative international networks. Unlike other infrastructure programs, all applications and online services of IDI are inclusively designed to accommodate alternative access needs associated with diverse abilities, languages or cultural preferences.

The Ontario College of Art & Design (OCAD), the new home of the ATRC and the IDI, is Canada's "university of the imagination," engaging in education and research and contributing to the fields of art and design, local and global cultural initiatives, and knowledge and invention across a wide range of disciplines. OCAD helps shape imagination through the delivery of art and design education at the undergraduate and graduate levels in a learning environment that integrates studiobased education with historical, critical and scientific inquiry. OCAD values accessibility, cultural diversity, equitable global citizenship, art and design advocacy, aesthetic and formal excellence, sustainability and entrepreneurship. OCAD's unique learning environment draws from its high-quality, diverse research practice, undertaken with extensive outreach and partnerships.

The project will draw upon OCAD's expertise and deep knowledge in communication, media and branding to plan and prepare outreach materials and an outreach campaign that captures the imagination and engages the understanding of the diverse audiences to be addressed. OCAD is also home to the Mobile Experience Innovation Centre which will be relied upon for knowledge and technical expertise in the proposed Mobile Learning implementation.

C. Inputs

It can be said that, in retrospect, all the efforts of the ATRC (and the many project partners collaborating with the center) over the past 16 years have been strategically conducted to culminate in this effort. The ATRC has refined and mastered the skills, collective wisdom, best practices, research evidence, theoretical framing and deep knowledge of the constitutive competencies needed to successfully lead this project. The inputs are in large part drawn from this rich store of experience and prior work.

1. Core Project Team

The core project team includes experts in the areas of accessibility, ICT in education, online learning, online communities, Web environments, user experience design and development, participatory design and software architectures drawn from the ATRC and the Fluid community (please see key team member CVs in Appendix 1 and description of the Fluid Project in Appendix 2). This team has refined collaborative processes, project management, design and community building practices through numerous open source projects related to education. (Specifically the Fluid project distributed collaboration process has been recognized as an exemplar by other open source projects and is the subject of at least 6 graduate thesis looking at distributed community building and collaboration.)

One strength of the team is to employ practices that recruit and ultimately shift responsibility for the sustainability of the effort to the larger community. By its very nature Fluid is embedded in other projects and is therefore well equipped to conduct a project that will embed accessibility and inclusive design in the OER

community. Fluid and the ATRC are also respected and have deep ties to the various tenets of the accessibility community globally.

2. Strategic Partnerships

The project will draw on strategic partners internationally and within the current OER initiative. The guidelines, inclusive design supports, and AccessForAll components will be embedded in existing OER repositories and portals. The project will partner with key OER efforts in the first year (OER Commons, Monterey Institute for Technology and Education and Connexions) to design, prototype and refine the accessibility supports and expand this to include as many OER efforts as possible in the second and third year.

The project will conduct a model mobile learning OER implementation which will engage several partners with the embedded expertise, implementation infrastructure and existing user communities in Africa and Brazil including OER Africa, the University of Capetown, Strathmore University in Kenya (specifically its Mobile Bootcamp), and IPTI in Brazil. Each of these organizations brings a unique competency to the overall project (see Appendix 2 for partner profiles).

FLOE will work with Mozilla to integrate personalization of the interface and personalized resource discovery into Firefox as an OER delivery platform and to create a Mozilla Drumbeat project that recruits an internet community to produce needed resource alternatives (see Activities for further details). Discussions are also underway with Apple, RIM and Google regarding research and development collaboration to embed the personalization techniques into popular mobile devices and tablets (iPad, iPod, iPhone, Blackberry and Android).

3. Community and community building processes

The Fluid approach to community building and tackling seemingly-insurmountable or overwhelming issues is based upon organic project growth emanating from a core of successful, demonstrable components or modules that address the primary “pain points” (or user-identified needs), and an agile, user-centric participatory design model rather than rigidly constricting the scope of the work, the members of the community and the users of the deliverables. This approach has worked well to grow a sustainable community, match outcomes to expectations and generate commitment and trust from necessary participants and interested volunteers. In our experience the cumulative completion of relatively-small-scale demonstrably successful modules that address specific user-identified needs garners buy-in, inspires imaginative extensions or derivatives, recruits further effort and acts as a locus to develop a community of practice. This approach also avoids unrealistic expectations and the disillusionment that inevitably follows. It insures that the scope and beneficiaries of the project can be defined by the community and are sufficiently flexible and agile to address unexpected opportunities and challenges.

The FLOE project will draw from the OER, learning object repository, open source, community source, accessibility, and general volunteer communities. Another strategy to be adopted from Fluid and ATutor are a clear delineation and communication of how potential community members can help or be useful in a variety of areas (not just code), reward mechanisms that recognize a diversity of contributions and feedback mechanisms that help to direct and shape the contributions.

FLOE will rely heavily upon the guidance and advice of established OER initiatives. FLOE will consult with members of the broader community continuously to help calibrate the activities.

4. Research, evidence and best practice

FLOE will build upon several bodies of knowledge to inform the design of components to be embedded in the OER ecosystem. In addition to research directly related to the OER initiative globally, one useful source is the learning object repository effort in Canada and elsewhere. Canada pioneered curriculum pooling, sharing and reuse through “Connecting Canadians” programs in the late 90s and early 2000s (e.g., http://edusource.netera.ca/english/home_eng.html, <http://www.sfu.ca/~mhatala/pubs/CATE2002-hatala-richards.pdf>). Unfortunately this program was abandoned with the new federal administration in 2005. However there is a large body of research related to educational resource reuse and learning outcomes related to online delivery. This research effort was continued through networks such as LORNET, Quality4Reuse and other efforts (<http://lornet.ca>, <http://www.q4r.org>). The European Commission through IST projects, JISC research and CEN workshops has advanced this research agenda more recently and will act as an additional source for guidance. Treviranus will also draw upon her participation in a number of elearning research networks, including Sem Tech, LORNET, eCompetencies, Education Futures, ELSACC and AEGIS.

5. AccessForAll Metadata and implementations

AccessForAll is a learning delivery approach and the associated interoperability standards and specifications needed to support learner-centric optimization of the learning resources and delivery environment. AccessForAll was developed in part to address access to learning for people with disabilities in a more sustainable, integrated way. Spearheaded by Treviranus and the ATRC with support and participation from NCAMs Specifications for Accessible Learning Technologies, the IMS Global Learning Consortium, the Open University in the UK, IBM, ISO/IEC JTC1 SC36 and many others AccessForAll is now an IMS specification, ISO standard, and is implemented in a number of learning applications globally.

The AccessForAll specification and standard consists of two main parts: a) a common language for expressing the learning needs of a learner with respect to presentation of material, method of controlling the learning experience, organization, supports or scaffolds and learning style or approach (embedded in LIP and other preference systems) as well as b) a common language for describing resources and user interfaces so that they can be matched to learner needs and preferences (with bindings to Dublin Core and IEEE LOM metadata). The standard has been tested and continuously refined through a number of implementations since 2000 including BarrierFree, The Inclusive Learning Exchange, TransformAble, EU4All, Teacher’s Domain, K12 Library, the OPS AccessForAll Infrastructure and other implementations.

FLOE will both exploit the lessons learned from prior AccessForAll implementations and provide feedback to the ISO and IMS standards process to update the standard to address changes in the learning and online delivery domains.

6. Fluid Components and Architecture

Fluid is an international open source community that works on infusing inclusive design into other software projects. Fluid addresses the dilemma of providing a consistent interface while meeting the diversity of user needs including needs associated with language, culture, ability, age and other forms of human diversity. Fluid includes a living library of inclusively designed user experience components, a supporting software architecture, supports for user experience design, and community processes for open source communities to address usability, accessibility, effective documentation, quality assurance, security and other precarious values. Fluid components are part of the most popular Web application toolkits including JQuery and Dojo. This implies that when developers develop Web applications using standard software development processes using these popular toolkits, they will automatically address accessibility requirements. Fluid components are embedded into applications such as FireFox, academic applications such as Sakai, ATutor, uPortal,

CollectionSpace, and OpenCast as well as over 100 IBM applications. FLOE will use Fluid as a base to create useful components to embed in existing and future OER initiatives.

7. Open Source Authoring Utilities and Toolkits

One of the lessons learned in monitoring compliance to accessibility requirements is that compliance is not achieved by providing a set of rules, guidelines or regulations to be followed. A far more successful means of achieving broad compliance is by embedding the creation or production of accessible resources or content into the tools used for authoring the content. This has the effect of achieving compliance even when the author has neither the knowledge nor the motivation to comply with accessibility requirements. Even when there is motivation and knowledge, authors require supportive authoring tools to enable efficient production of accessible resources. FLOE will integrate and enhance a number of authoring utilities and toolkits to support the creation of inclusively designed learning resources. These include metadata wizards, captioning and description tools, styling and “skinning” systems, accessible activity templates and checking tools.

8. Participatory design practices

FLOE will employ a participatory design approach, refined through Fluid, to create outreach materials, embeddable components, mobile learning systems, and inclusive authoring supports. The OER community is as diverse as the learners it hopes to serve. The project will engage participatory design approaches to tailor the deliverables to the diverse contexts and perspectives represented by this community and the Accessibility community. The participants will include individuals in the full range of roles.

9. Networks and links with key accessibility, policy and standards initiatives

Treviranus and the ATRC have extensive, long standing networks and links with key accessibility, policy and standards initiatives in North America and around the world. Treviranus is a Chair in the Web Accessibility Initiative, represents accessibility at the ISO information technology for learning, education and training group (JTC1 SC36), sits on numerous think tanks, decision making bodies and stakeholder forums related to accessibility and represents accessibility on generic decision making bodies relevant to online learning. The same can be said for many members of her team.

10. OCAD Communication and Media Design

The first activity of FLOE will be to create an education and outreach campaign. This will employ the considerable talents and experience of the OCAD communication, media design and branding program. Faculty members, researchers and students will be engaged to create messaging in multiple media that reaches the full range of audiences. ATRC and the IDI will insure that the materials are designed inclusively. OCAD has won numerous media and communication awards and is known for successfully capturing complex, nuanced messages in easy to grasp, engaging ways.

11. IDI infrastructure

Treviranus is the principal investigator of the Inclusive Design Institute a multi-university infrastructure project that is unique in the world as it provides infrastructure that is inclusive of researchers speaking many languages, from many cultures and with disabilities. The infrastructure includes collaboration tools, academic software and social networking applications that are accessible, translatable and supportive of a variety of cultural conventions. This infrastructure will be used to host FLOE and FLOE deliverables and will be available to the OER community.

12. Funding Resources

In addition to funding requested from the William and Flora Hewlett Foundation, FLOE will match with funds from UNESCO, the Ontario Ministry of Research and Innovation, and the Canadian Foundation for Innovation, this funding has been secured. In addition the partners in FLOE will contribute considerable in-kind resources. FLOE will also build upon prior investments by The Andrew W. Mellon Foundation (for Fluid, Fluid Engage, Decapod, OpenCast and OLE), the William and Flora Hewlett Foundation (in OpenCast) and the Ontario Diversity Directorate. During the course of the project FLOE will seek further funding resources for the initiative and for partners within the OER community implementing FLOE outputs (through relevant state and federal granting programs targeting accessibility).

D. Activities.

We are proposing a three year project with several sequential but overlapping activities. This document outlines a detailed plan for the first year but gives a more general outline of the second and third year to allow leeway for adjustment in response to changing circumstances or knowledge gained. (One of these details is the project partners to be added in the second and third year.)

The broad objectives of the 3 years will be as follows:

Year 1												Year 2												Year 3											
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Outreach and Awareness Materials and Activities																																			
Create guidance to Inform policy																																			
Requirements Gathering and Participatory Design																																			
Design & Develop Embeddable AccessForAll Components												Ongoing iterative refinement of components																							
Design and develop Authoring Toolkit to Embed in OER projects												Ongoing iterative refinement of authoring toolkit																							
Facilitate funded collaboration between OER initiatives and accessibility service providers																																			
Pilot integration into OER Commons and Connexions																																			
Build Open source community to support OER accessibility																																			
Mobile Learning Project																																			
Formative Evaluation																																			
												Broad integration into OER initiatives												Integrate learner-centric search into mainstream internet tools											
Build Mozilla Drumbeat project to supply needed alternatives																																			
												Create integrated Demand service												Setup supply links for demand serv.											
												Design evaluation tools																							
												Report												Report											
																								Evaluation											
																								Report											

A more detailed technical timeline for Year 1 can be found in Appendix 3.

Bi-directional Community Outreach and Awareness Campaign

FLOE will create a basic set of education and outreach materials to be distributed in multiple media, to a variety of audiences, from a range of perspectives. FLOE will recruit the expertise of the Ontario College of Art & Design Faculty of Design, Communications Department to design the message and presentation. The materials will be open access and inclusively designed.

The intended audiences and messages will include:

1. OER producers and implementers to communicate that:

- accessibility benefits all learners and promotes innovation (counter to expressed notions that accessibility is difficult, onerous, about a small set of learners, or discouraging of creativity and technical innovation).
- inclusive design is completely in line with OER values and goals and will help to address these goals.

The messages will promote a learner-centric approach to instructional design. The materials will include a distillation of the basic requirements for inclusive design to be integrated into current OER channels.

2. Accessibility advocates, service providers and thought leaders, specifically addressing individuals concerned with accessibility throughout the educational delivery framework, to communicate that OER:

- provide a viable means of bypassing the DRM conundrum,
- have a far greater potential to address the diverse learner needs of learners with disabilities, and
- can be used to meet accessibility legislation and policy.

3. Potential OER participants who are motivated by contributing to inclusion or accessibility.

The outreach materials will be created:

- in printed form (for distribution at conferences, meetings and events),
- in Web form suitable for inclusion on a variety of relevant Web sites,
- as RSS feeds,
- for distribution over a variety of social networks including Twitter, Facebook, LinkedIn and others, and
- as digital files that can be integrated into proposals, correspondence and courseware.

FLOE will also generate popular press articles (including OpEds for newspapers, popular journal articles, blogs and wikis) as well as strategic professional and academic journal articles (articles and chapters have already been committed to a curriculum journal and an Open University book entitled “Collaborative Learning 2.0 - Open Educational Resources”). FLOE will also deliver presentations, keynotes and workshops at, or collocated with, strategically chosen conferences and events in the OER community, the broader education domain and the accessibility domain (e.g. OpenEd Tech, OpenEd 2010, Closing the Gap, CSUN Accessibility and People with Disabilities, Council for Exceptional Children).

Embed Inclusive Design Support into Existing and Future OER Platforms

Here we will not create new, separate or specialized systems. The focus will be on embedding the needed enhancements to the existing OER platforms and delivery mechanisms and capitalizing on the added benefits of inclusive design.

These enhancements will be largely based on the existing and evolving ISO 24751 or AccessForAll interoperability standards and tools. As discussed in “Inputs” these are multipart standards or specifications that provide both a common language for learners to describe their functional learning needs (methods of display, methods of control, supports, organization of material, etc.) and a common language for describing the learning needs met by a specific resource. These standards incorporate and have been informed by input regarding meta-cognition or “learning to learn” theory as well as accessibility requirements. This enables delivery systems to match learner needs with the best resources to meet the needs. This match can be achieved through resource transformation (e.g., restyling), resource aggregation (e.g., adding captions to video) or resource selection.

The following outlines the steps to be taken to enable this matching process (for a more technically-specific description of these activities please see Appendix 3).

A. Embedded Inclusive Design Supports for OER Producers or Contributors

FLOE will distill the minimal accessibility or inclusive design requirements that should be part of all resources moving forward - to enable transformation, and label learner needs met. Rather than provide a set of rules to be followed, these authoring practices will be enabled through an authoring toolkit that includes templates, styling tools as well as tools to create alternative content (e.g., captioning, and description) to be delivered through existing OER initiatives to OER producers. This authoring toolkit will pull in existing tools and utilities that support the creation of captions, descriptions, accessible graphics, editable math and science notions, conversion utilities (e.g., epub), well structured text and styling mechanisms. For applets or other interactive resources the toolkit will pull in reusable user interface (UI) components for flexible rendering and UI components for interactive curriculum (that support keyboard control, Assistive Technology interoperability and portability). The toolkit will also provide checking or evaluation tools that enable OER producers to check the resource against the accessibility requirements.

B. Embedded Supports for Labeling Resources

In order to find a resource that matches a learner's needs, resources must be appropriately labeled or identified or it must be possible to determine the learning needs that are addressed by the resource. Most OER repositories provide some form of metadata that describes the resource and a process for deriving that metadata from the OER contributor. This metadata requires minor enhancements to add learner-centric information about what learning needs the resource is and is not designed for. This will be based on the ISO 24751 metadata bindings. First FLOE will create a pluggable utility to derive as much metadata as possible programmatically without human intervention. For information that cannot be derived programmatically FLOE will produce a user interface component that prompts OER producers and OER users to provide and refine the metadata. This will be designed so that it can be easily integrated into the OER workflow.

C. Embedded Supports to Enable Learners to Identify Functional Learning Needs

Easy to provide and usable information about the other side of the match is also needed. We need to know information about the learner's functional learning needs. This includes information about their needs and preferences with respect to how the resource should be presented or displayed, how they wish to control or navigate through the resource, what additional learning supports they need (e.g., glossary), how the resource should be organized, functional information about their learning style or approach and other relevant and actionable information. This would be based on the ISO 24751 part 2. FLOE will develop pluggable wizards or UI components that enable the learner, or people supporting the learner, to specify a learning profile based on ISO 24751. These will be built upon the Fluid Infusion UI Options component. The components or wizards will be integrated into OER Commons, Monterey Institute for Technology and Education projects and Connexions initially. Following testing and refinement they will be added to other OER initiatives.

D. Embedded Mechanisms for Matching Learning Needs with Resources that Best Meet those Needs

To achieve the functionality described, existing OER discovery tools or search engines need to be enhanced to a) add learner needs search criteria and b) mechanisms and search algorithms that enable matching these criteria or successfully resolving the request. FLOE will create a fit-to-purpose pluggable service to match learner needs and preferences (through either replacement, augmentation or transformation). This service will handle graceful degradation if a complete match is not found and link to the Demand Service discussed below. These components will be embedded in existing OER discovery and delivery mechanisms beginning with OER Commons, Monterey Institute for Technology and Education projects and Connexions.

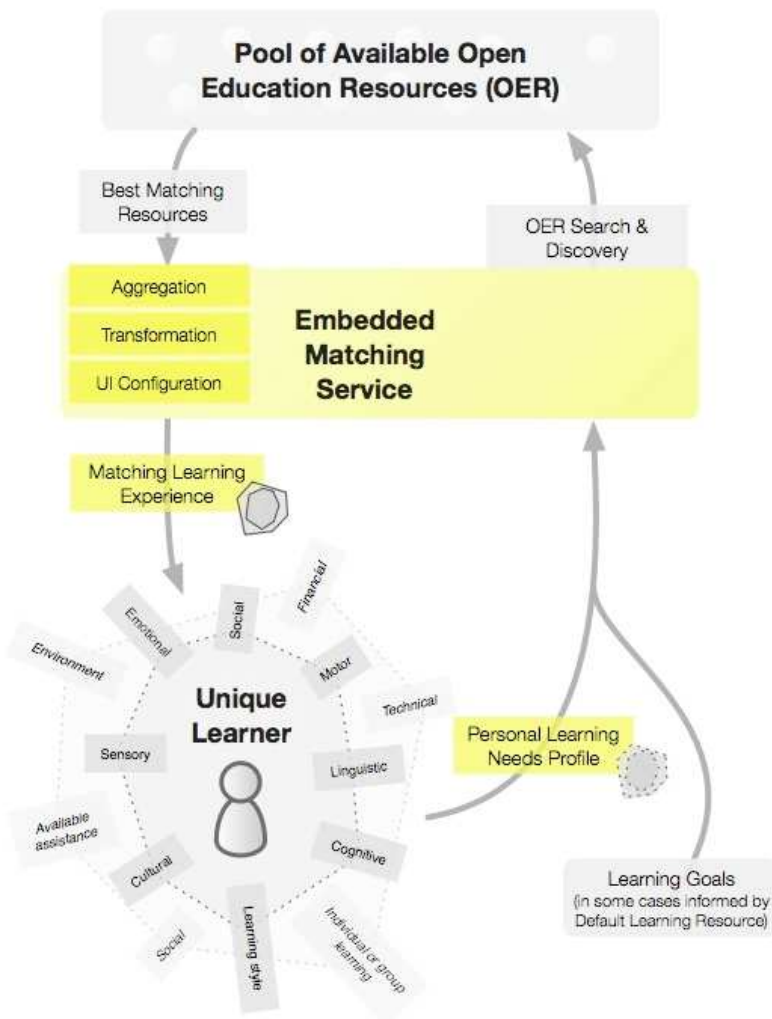


Figure 1: Matching unique needs of learner

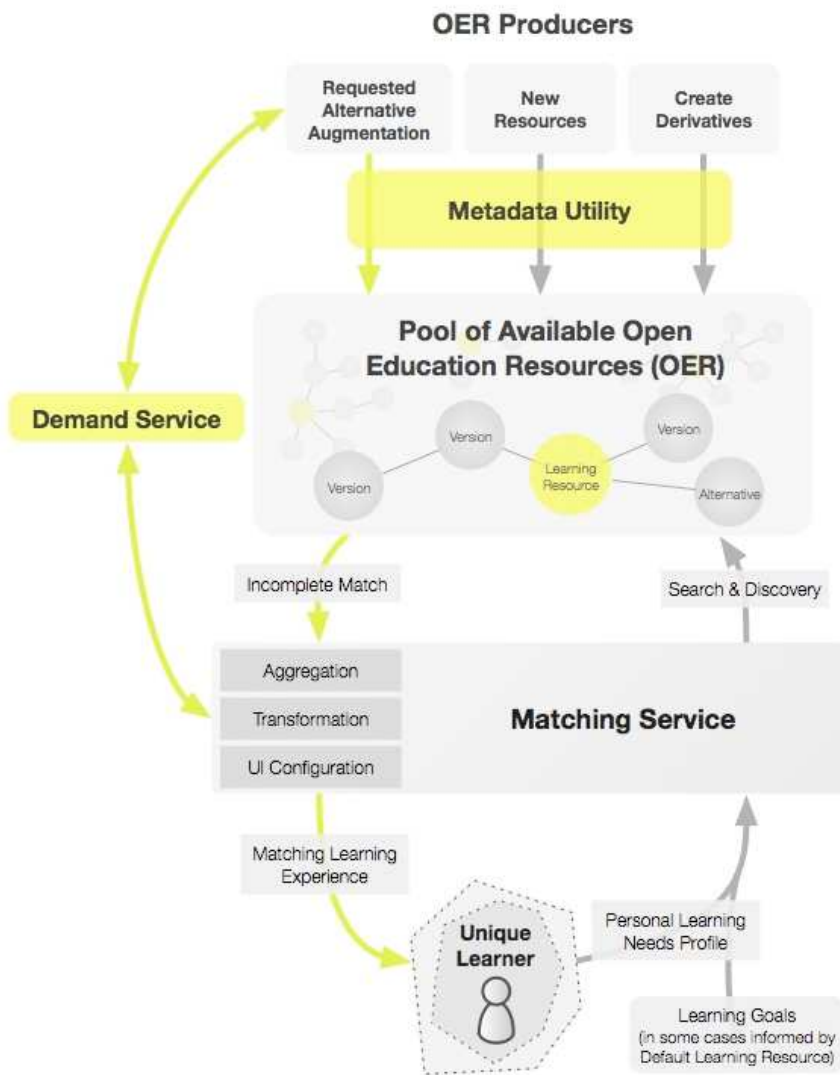


Figure 2: Supporting OER producers

Facilitate Funded Collaboration Between OER Initiatives and Accessibility Service Providers

There are many opportunities at the institutional, school board, state and federal level to provide educational content for learners with disabilities. These include requests for proposal, textbook adoption opportunities, projects initiated through state house bills and other forms of requesting and funding accessible curriculum. FLOE will facilitate collaboration between OER initiatives and accessible service providers to respond to these opportunities. FLOE will help at both the proposal and implementation phase.

Leverage Demand for Mobile Learning Internationally to also address Accessibility

Given the pervasiveness of mobile systems in countries in Africa, South America and Asia there is an urgent demand for educational resources that can be effectively delivered over mobile devices. Through a partnership with OER Africa, University of Capetown and the Strathmore University mobile boot camp, an inclusively designed mobile delivery pilot will be conducted. This will embed the previously discussed components and

approaches to also enable rendering on multiple mobile platforms, incorporating the necessary graceful degradation.

The partnership will identify 2 high impact academic programs offered by OER Africa that would benefit from mobile delivery. The work will build upon the successful mobile rendering components developed through Fluid Engage.

Beginning in April 2011 the partners will:

- Gather user requirements including a profile of mobile devices used, available presentation and control modes and network constraints (audio only, small screen, WAP and SMS text messaging, audio and video, numeric keypad or extended keypad, on-screen keyboard, availability of mobile browsers, etc.)
- Design and develop an audio server
- Design and develop content conversion routines and tools for small screens, audio-only and text message delivery (e.g., adapt text-to-speech engines, skinning systems and style sheets)
- Iterative implementation, evaluation and refinement in the chosen pilot contexts
- Fully integrate into OER Africa
- Make components, tools and lessons learned broadly available to other mobile learning initiatives
- Broadly integrate these components into OER projects to enable mobile learning delivery (linked to accessibility tools and components)

Distributed Network of Demand Services

The existing pool of resources will continue to have many gaps, even with authoring supports to create easily transformable resources. The available resources will fall short of meeting the needs of specific learners. To address this FLOE will create a series of resource alternative demand services. This will be a parallel activity to be fully implemented in Year 3.

A Mozilla Drumbeat project called “Inclusive Learning” has been created and introduced at a Mozilla Drumbeat event in Toronto. See: <https://www.drumbeat.org/projects>. The proposal is to recruit the larger community to create needed resource alternatives whether captions, descriptions, or other forms of alternative presentations. The project resonated with most participants. Many recalled times in their lives when the teaching approach fell short of their learning needs. Others offered a variety of specialized areas of expertise (e.g., math, science, engineering). In response to community suggestions FLOE will also investigate creating a “Help me, I don’t get it” network that recruits peer learners to proffer alternative learning strategies or resource framings that have worked for them.

In addition to this more informal volunteer network FLOE will work with the Indira Ghandi Open University (IGNOU) in India, the Accessible Instructional Material Center in the US and a number of accessible media providers (including the WGBH National Center for Accessible Media) to develop a hybrid voluntary and commercial demand system for accessible resource equivalents or enhancements. IGNOU offers an innovative and unique program in Applied Sign Linguistics, as well as programs in special education for cognitive access, vision and hearing impairment. IGNOU will help create a supply network for sign translation, captioning and description.

Embed Support for Inclusive OER discovery and delivery into broader content delivery systems

Ideally the inclusive design approach should not be limited to OER initiatives but should harness the wealth of learning material on the Web. FLOE will engage browser, search engine, digital publishing and digital delivery developers in designing ways to integrate personalized learning resource discovery and delivery mechanisms into the Web at large. Discussions have begun with Mozilla, Google, EPub and Apple. One confirmed project will be a Firefox extension that enables learner-centric transformation of the interface and rendering of learning content.

Summary of Activities: Strategies for Infusing Embedded Flexibility, not Imposing Standards

Years of experience with accessibility compliance patterns and outcomes have shown that externally imposed standards or guidelines are not effective and do not generate the kind of systemic change required. In the case of learning, a single standard, set of standards, or even the notion of standardizing learning is counter to inclusive learning practices.

If there is a standard to be complied to, it is to make OER and OER delivery more flexible and adaptable, for: alternative presentation modes, alternative delivery platforms, alternative languages, easy updating and the creation of derivatives. To achieve accessibility for the range of learners (including learners with disabilities) we then need:

- 1) a diverse pool of OER, with multiple choices for arriving at the same learning goal, and
- 2) a means of finding the right resource for the learner.

If the right resource cannot be found we need a backup plan to adjust/augment the available resource or create the needed resource.

Rather than imposing standards for this type of flexibility, strategies that are more appropriate to the learning domain and a largely volunteer community are:

- embedding the groundwork needed to make learning resources adaptable to the needs of more learners and delivery platforms into the authoring tools or utilities used to create OER (whether OER specific or general Web tools),
- seeding the community with foundational components that have the necessary flexibility built in (and happen to address needs expressed by the community unrelated to accessibility),
- supporting the creation of derivative resources, and
- supporting labeling of resources with information regarding the learner needs met as part of the “checking in” and automatic metadata process.

FLOE will:

- Provide authoring toolkits and utilities for the more difficult to make flexible OER types such as interactive scripts, videos, math notation, science notation, music notation, mobile presentations (these happen to correspond to tools and utilities the community has expressed a need for regardless of accessibility).
- Create reusable, flexible components for interactive applications.
- Provide the necessary pieces to be added to metadata functionality in existing OER repositories and portals, to label resources regarding learner needs.
- Create wizards or utilities to be embedded in existing OER repositories and portals that enable learners and their support team to specify their individual learning needs.

The following describes what this approach means for each of the following OER community members:

OER Repositories or Portals

1. Integrate a component provided and customized by FLOE to augment existing metadata with metadata about learner needs met by a resource (this metadata has existing bindings to both Dublin Core and IEEE LOM)
2. Integrate a component provided and customized by FLOE to enable learners to specify their individual learning needs
3. Integrate or communicate with a utility provided and customized by FLOE that matches learner needs with the needed resource and a demand service for unmet learner needs
4. Support the creation of derivative resources
5. Make available or link to authoring utilities provided by FLOE that assist in creating more flexible OER
6. Encourage the use of open standards and open file formats (optional)

(OER Commons, Connexions and MITE support these steps and will act as models for other OER initiatives in the first year)

OER Contributors

1. When checking in a resource provide information about the learner needs met by the resource as part of the current process for giving information about the resource
2. Use open file formats wherever possible (optional)
3. Allow the creation of derivatives
4. Use the authoring utilities and components provided by FLOE when appropriate (optional)

Learners and/or their teachers

1. Use the utility/wizard to specify personal learner needs
2. Provide feedback about whether the OER used met the needs (optional)

The approach will draw in and facilitate contributions from the existing accessibility community, alternative format service providers and the larger international volunteer community. It will facilitate a more balanced exchange between OER contributors in “developed” regions and regions currently delegated as consumers or receivers of OER.

No Retrofitting Required

The proposed approach means that even if not a single current resource is retrofit the community will be moving toward more accessible learning for all learners and that there will be a means of meeting the needs of learners with disabilities. The proposed approach encourages the creation of resource variations that match the variety of learner needs. The approach also nudges the community toward creating more flexible resources to address accessibility but also device independence, easier updating and internationalization.

E. Outcomes

The ultimate goal of the FLOE project is inclusive access to personally relevant, engaging learning opportunities for the full diversity of learners through the distributed global network that is the OER community, thereby also increasing the adoption and learners reached by the OER effort.

Helping OER cross the Innovation Chasm

The OER community is said to be crossing the critical innovation chasm to broad adoption or ubiquity. FLOE and a general move toward more inclusive design can help. Innovation occurs at the margins of any domain. It is a known phenomenon that a diversity of perspectives promotes innovation, better planning, prediction and decision-making (Scott Page). Many creative innovations and leaps forward are caused by accommodating users at the margins or outside the present scope. A tried and true edict of entrepreneurship and successful marketing is to find and address the unmet needs and shortcomings or weaknesses in the status quo and the potential “customers” who are dissatisfied with what is currently offered. In the case of education it is the disenfranchised and marginalized learners; disillusioned educators who lack the resources to address the increasing diversity of students; educational administrators who have become cynical about the commercialization of education and the tug-of-war over intellectual property rights at the expense of learners; and, planners and forward thinking policy makers who recognize the current constraints and shortcomings of the education infrastructure and feel that unencumbered, open and inclusive access to knowledge is the only means to sustainable prosperity. FLOE aims to serve each of these groups.

The political and legal commitment to equal access for people with disabilities is taking hold globally and will only be strengthened by an aging population in western nations, an increased prevalence of people with severe disabilities in all age categories (in large part due to medical advances that enable individuals to survive with disabilities), conflict and environmental disasters globally, and greater access to advocacy channels through the internet. OER will not be accepted and cannot cross the chasm unless it is inclusive of people with disabilities. But much more importantly participation by a greater diversity of previously marginalized learners and educators will help to generate the innovation needed to cross the chasm.

Addressing the needs of doubly marginalized learners

One problem with the implementation and interpretation of accessibility legislation intended to support inclusion is that it has become exclusive and narrowly defined. This is in part due to the pressure to contain costs and create a testable legislative compliance mechanism. Unfortunately this creates a large group of doubly marginalized learners. These learners are not served by mainstream education nor by service enhancements and programs intended to serve learners with disabilities. This includes children whose families or support mechanisms do not have the financial resources, administrative savvy or advocacy skills to enable the child to qualify for special services. It includes learners who do not fit the narrow classifications of disability, especially as it relates to learning or cognitive disabilities. It includes students who only receive attention once it is too late, once they have become a “disciplinary” or “behavior problem.” OER and the inclusive design approach of the FLOE project can help address this dilemma by supporting a relative framing of accessibility that recognizes the unique needs of all learners and by providing a system to match those needs.

Offer a more integrated approach to accessibility

One real risk faced by the accessibility community is that the community has been fighting so hard to catch up with where the rest of the education system is at presently that it will get there just as everyone else has moved on. The accessibility community is spending a great deal of passion and energy to achieve equal access to:

- printed textbooks as textbooks are moving to digital, interactive formats,
- traditional learning management systems as online learning is moving to social-network-based mash-ups,
- didactic pedagogical practices such as lectures as these are being called into question, and
- traditional tests and standardized assessments as alternative assessment and certification processes are being sought.

The irony is that learners with disabilities are best served by the advances being advocated by educational innovators. FLOE will work to redirect the focus of the accessibility effort to the options and opportunities offered by OER efforts and the associated innovative educational practices. FLOE will provide a more integrated alternative to providing learners with disabilities inclusive access to education. If the accessible approach is used and demanded by all learners it will be much more sustainable and will be updated with mainstream approaches. This will significantly reduce the need to “catch up.”

Greater Global Participation

The trek across the chasm will no doubt be fueled by global participation in the OER effort. Not only is there an overwhelming unmet need for access to learning opportunities but much more importantly there is a massive untapped human capacity to contribute to the OER effort. A number of strategic adjustments must be made to release this pent-up potential. These adjustments are in line with the proposed inclusive design agenda.

1. The first adjustment is to shift the impression of the OER effort from access to consumption of knowledge to participatory learning. OCW has been characterized as giving the world restricted rights to audit courses. It currently supports a unidirectional, didactic, “sage on the stage” model of education. From a pedagogical and political perspective this is problematic. It perpetuates an unequal relationship between the producers and consumers of the knowledge on offer. Inclusive learning is dependent on a diversity of resources to address a given learning goal. This requires supports for creating derivative works, localized alternatives, and translations that go beyond merely linguistic and modal translation, or a much more participatory and bi-directional OER environment. FLOE will create a compelling demand channel for contributions globally to meeting diverse learner needs. This will help to balance the OER ecosystem and hopefully help to open the way for equal participation in the educational exchange. One strong objection and therefore impediment to this shift is concern for quality control. The academic world does not yet seem willing to accept the Wikipedia take on quality control. FLOE and OER in general must create transitional, participatory means of quality assurance.
2. Much of the world does not have access to the Internet or has unreliable access to the Internet and electricity. However the saturation of mobile phones or devices is pervasive in even the most under-resourced areas. To achieve global participation we must accommodate a diversity of delivery means including cell phones restricted to audio delivery. The same design principles and technologies that provide access to learners who are blind, dyslexic or severely motor impaired also make it possible to deliver OER over cell phones or other mobile devices. FLOE will capitalize on this complementary relationship between inclusive and mobile learning to increase the “return on investment” for inclusive design for OER producers by making it possible to achieve both at the same time. This move will also set up a virtuous cycle of greater participation, leading to a greater diversity of contributions, leading to a greater diversity of learners served.

How is this Approach More Sustainable than Other Accessibility Approaches?

The proposed approach provides a just-in-time strategy rather than a just-in-case strategy meaning that there is no effort expended that will not be useful to a learner. The approach also supports a just-what-is-needed or

exactly-what-is-needed and not an everything-that-could-possibly-be-needed strategy. This implies that any effort will have an immediate, concrete utility.

The proposed approach also reduces redundant effort as it encourages better labeling and the matching utility will enable tracking of resource variants. This will prevent the current pattern of redundant creation of accessible alternatives reported by special education providers who have tried to use OER.

Most importantly the proposed steps will benefit everyone in the OER community and not just a segregated group with specialized needs. The approach will support:

- easier updating of OER,
- easier internationalization,
- mobile delivery,
- better matching of all learner needs including disabilities,
- a greater variety of OER,
- contributions from a larger international community, and
- personalized learning.

An integrated approach is far more resilient, less costly and thereby more sustainable.

How will the Initiative be Sustained Financially?

The most sustainable funding model is a diverse, distributed funding model with costs and benefits distributed as broadly as possible over a large number of communities and sources. The proposed approach sets the stage for this. In addition the approach hopes to effect significant savings and efficiencies at various levels.

Once the functionalities discussed above are integrated into the OER ecosystem the cost of meeting accessibility commitments will be broadly distributed to: 1) the international volunteer community that provides the primary engine for ongoing OER production (who will have one more compelling reason to contribute and who will be enhanced by the addition of contributors motivated by the prospect of serving learners with disabilities), 2) the various education systems that utilize and support OER (who will now be able to rely on OER to meet commitments to learners with disabilities) and to 3) current alternative format service providers (who will now be linked into the OER networks).

The only significant persistent cost will be when the back-up demand service must resort to commercial alternative services providers. This does not add an additional cost as accessible education delivery already invests heavily in these services. FLOE proposes to make this more efficient, less redundant and reduce reliance on these services for alternative formats that the community can provide.

Education providers globally invest a large amount of money and effort in meeting the needs of the small group of learners who qualify as having a disability. A large portion of this investment frequently goes toward certification and monitoring programs to qualify learners and justify expenditures. This investment funds a great deal of redundancy: redundant creation of alternative formats and redundant segregated or special service provision. Given the structure of the system these services exclude a large group of learners who need help but don't qualify. The proposed approach reduces this redundancy by making it easier to find alternative resources, provides an integrated approach, obviates the need to qualify learners for special services, and meets the needs of currently un-served or underserved learners.

An economic impact study in Ontario characterized inclusive design as releasing constraints. The proposed approach will strategically create connections between existing efforts to release constraints in the learning supply chain to help enable the OER community to meet its potential for inclusive education.

Essential Deliverables of Year 1

The essential concrete deliverables of Year 1 are:

1. An outreach and awareness package that can be delivered in a variety of media to a variety of audiences
2. Embeddable components for labeling resources regarding learner needs met by the resource
3. Embeddable components to enable learners and or teachers to specify learner needs
4. Embeddable components to match learning needs with available resources
5. Preliminary authoring toolkit to assist in authoring flexible resources
6. Pilot integration into OER Commons, Connexions and MITE
7. Initial Mobile rendering tools

F. Evaluation

The project will engage Marlene Scardemalia and IKIT (Institute for Knowledge Innovation and Technology) of the Ontario Institute for Studies in Education and her community of practice for both formative and summative evaluations of the strategy and outcomes. Criteria to be evaluated will include:

- reach of outreach and awareness campaign in the accessibility and OER communities (e.g., through analysis of occurrence of topic on relevant social networks and other forums, pre and post interviews, etc.),
- usability of embedded components to enable personalized resource matching (through representative user trails with learners, teachers, and OER contributors)
- rate of participation or engagement by OER initiatives in FLOE and integration of FLOE components
- use and successful response rate of alternative version demand system
- usability of pilot mobile learning material
- uptake of mobile learning tools by OER initiatives
- accessibility and OER collaborations that can be attributed to FLOE
- other criteria to be identified by the Hewlett Foundation and the FLOE partners to inform the ongoing effort.

In the process we also hope to address a bias against diversity, minorities, outliers and the margin, within traditional research methodologies employed in education. Popular and traditional statistical analysis focuses on norms and large controlled groups of participants that conform to a set of criteria. These methods tend to privilege the norm, the majority and the current stasis and largely ignore information about participants, behaviors and findings at the margin, in the minority or deviations that are not part of the classification. The methods may thereby ignore innovation, the unexpected or what is usually called ‘noise’. We would argue that this does not help us to discover transformative practices or ways to address the diverse needs of learners. Specifically traditional educational research methods are not suitable for the learning approach supported by this project, the proposed approach to inclusive learning does not employ a single controlled learning experience but a large diversity of learning experiences each adapted to optimize learning for a particular learner. This confounds traditional research methods as it introduces numerous factors that may influence outcomes. It also confounds traditional statistical analysis, as participants are diverse, making it difficult to get a “clean sample” that can contribute to the necessary “n” needed to draw statistically based conclusions.

Anecdotal evidence, within-user data or single case studies do not carry enough weight to undergird policy decisions that have large-scale impact.

The project will link to research methodology efforts globally (through efforts such as the Inclusive Design Institute and the European Commission ICT for Socioeconomic Impact) exploring new research methods, statistics and data visualization to assist in this reframing. A side benefit we hope to achieve is evaluation and assessment methods that are better suited to 21st Century learning, deep learning, diverse learners and diverse learning approaches.

The project partners will identify specific research questions needed to inform and evaluate the approach. It is anticipated that both small-scale studies focusing on a specific group of learners as well as large-scale studies based on available aggregate data will be designed and conducted. The goals are to establish evidence, shape the project plan and finally evaluate the project outcomes.

(Although this is beyond the scope of this project, in related efforts, Jutta Treviranus has begun discussions with researchers at Educational Testing Service, ETS, to explore methods of transforming high stakes testing to address this bias or weakness in individual assessment at the same time as accessibility is addressed. This discussion is based on the notion that post-industrial society or a knowledge economy requires unique, innovative, creative perspectives rather than learners that conform to a standard. Standards of quality must make room for non-conformity and innovation. Rewards, feedback, promotion and certification must recognize a greater diversity of achievements.)

G. Intellectual Property Rights.

Any code contributed directly to FLOE, will be covered by the Educational Community License (ECL) 2.0. All code contributions will require signing an ECL contributor's license agreement. All other (non-code) IP under this grant will be released under the Creative Commons Attribution 3.0 license. The project will also explore the option of dual licensing the code for the purposes of integration with copyleft licenses.

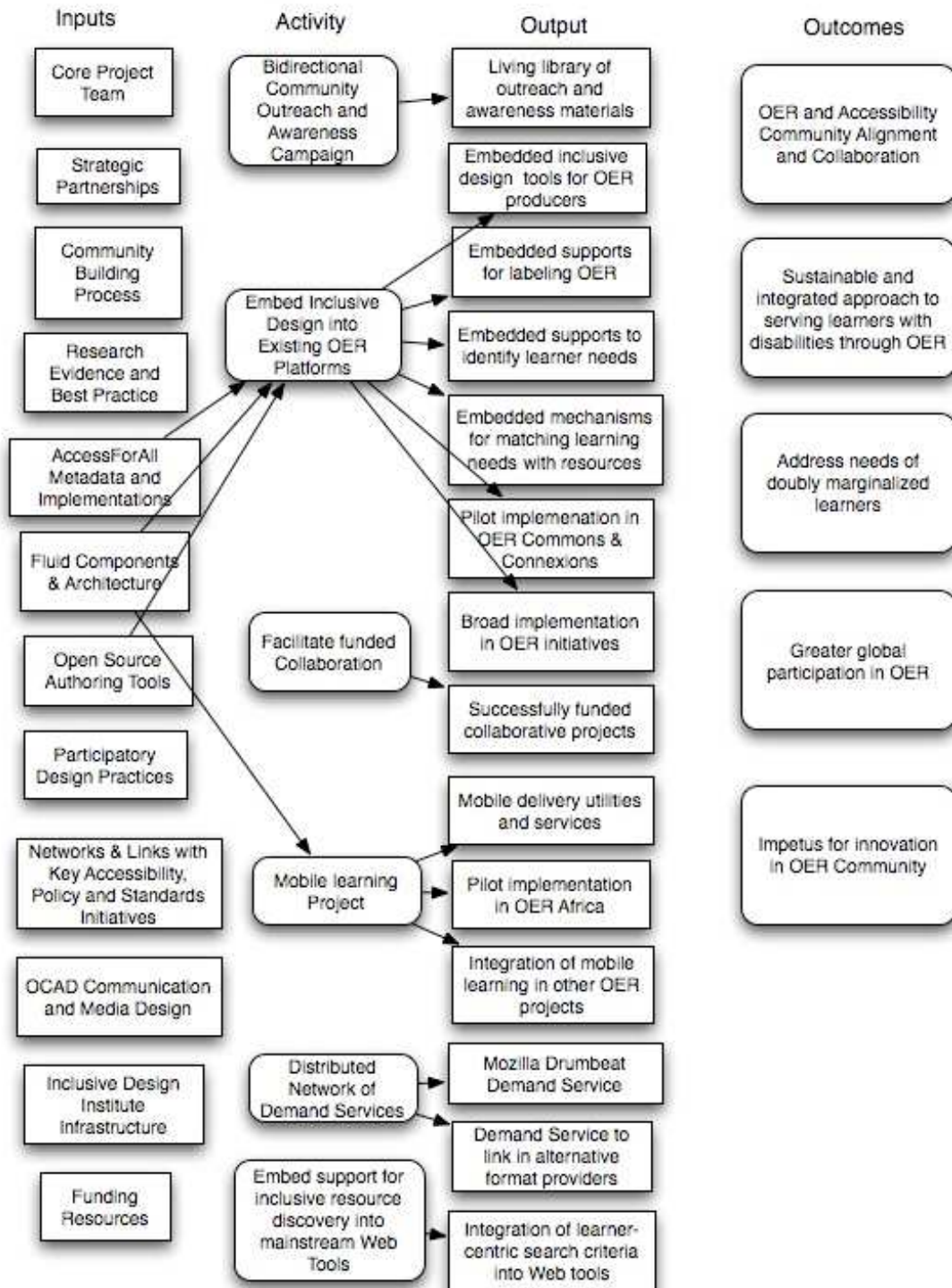
H. Compelling Reasons for the Grant.

Briefly, what are the three most compelling reasons why this grant should be awarded?

1. FLOE will provide persuasive impetus for greater participation in the OER initiative and greater use of OER, thereby helping the OER initiative to cross the innovation chasm. FLOE will enable the OER community to provide a sustainable and integrated approach to meeting the learning needs of learners with disabilities (whether these learners have qualified for special services or not) and complying with accessibility policy and legislation. FLOE will provide the motivations and the means for greater bidirectional participation in the OER effort by learners and educators internationally – to address unmet learning needs and to access mobile learning.
2. FLOE will promote and enable a learner-centric approach to learning delivery through OER. This will shift the focus from content to learning goals, from standardized education to personally optimized learning. This will encourage deep learning.

3. FLOE has gathered the necessary expertise, capacity and support to successfully complete the planned activities and achieve the objectives. The proposed approach resonates with the OER community and any learner who has faced barriers to learning. FLOE has refined practices to recruit the broader community to sustain the effort.

Section 3. LOGIC MODEL



Section 4. PROGRAM CHART

Ultimate Outcomes	Intermediate Outcomes	Indicators of Progress	Activities	Targets/Baselines	Target Date
OER and Accessibility Community Alignment and Collaboration	Living library of outreach, branding and educational materials for relevant audiences in various media	Awareness of inclusive design requirements in OER community and of OER in accessibility community	Bidirectional Community Outreach and Awareness Campaign	Positive cross references between OER and accessibility on prominent OER and accessibility sites	Year 1 month 12
Sustainable and integrated approach to serving learners with disabilities through OER	Embedded inclusive design tools and utilities for OER producers	Collaboration between two communities	Embed Inclusive Design Support into Existing and Future OER Platforms		
Address needs of doubly marginalized learners	Embedded supports for Labeling Resources	Integration of components into OER Commons MITE projects & Connexions		Successful integration into OER Commons MITE projects & Connexions	Year 1 month 12
Greater Global participation in OER	Embedded Supports to Enable Learners to Identify Functional Learning Needs	Integration of components into other OER projects		Integration into at least 5 additional prominent OER projects	Year 2 month 12
Impetus for innovation in the OER community	Embedded Mechanisms for Matching Learning Needs with Resources that Best Meet those Needs	Successful creation of learner needs profiles		Learner profiles created for at least 15% of learners	Year 2 month 12
	Pilot implementation in OERCommons, MITE Projects & Connexions	Learner needs metadata on OER		AccessForAll metadata on at least 30% of OER	Year 3 month 6
	Broad implementation in OER initiatives	Successful matching of learner's needs with OER		Majority of learners who use matching service express satisfaction with match provided	Year 3 month 12
	Successful funded collaborative projects	Collaborative applications to funding sources	Facilitate funded collaboration between OER initiatives and accessibility service providers	At least 2 funded collaborative projects	Year 2 month 6
	Mobile delivery utilities and services	Successful user trials of mobile learning in a variety of client devices	Leverage Demand for Mobile Learning Internationally to also address Accessibility	Mobile learning delivery for 2 academic programs	Year 2 month 12
	Pilot implementation in OER Africa	Successful implementation with pilot academic program			
	Integration of mobile delivery in other OER initiatives	Awareness and support for mobile rendering in OER projects		Implementation of mobile learning tools by 2 additional OER projects	Year 3 month 12
	Mozilla Drumbeat Demand service to deliver needed alternative resources	Active community with both learners and contributors	Develop Distributed Network of Demand Services	At least 50 participants in Drumbeat project	Year 3 month 1
	Demand service to link in	Participation by a critical mass of		Link IGNOU and at least 2 other	Year 3

	existing alternative format service providers	alternative format service providers		service providers	month 12
	Integration of learner-centric search criteria into mainstream Web tools	Interest and collaboration of mainstream Web tool developers	Embed Support for Inclusive resource discovery and delivery into broader content delivery systems	Integration into at least Firefox browser	Year 3 month 12

Appendix 2: Partner Institution Descriptions

The Institute for Knowledge Innovation and Technology

The Institute for Knowledge Innovation and Technology conducts research, develops technology, and helps build communities aimed at advancing beyond "best practice" in education, knowledge work, and knowledge creation. An international community from a variety of sectors is actively engaged in pooling intellectual resources and participating in projects.

BEYOND "BEST PRACTICE" IN EDUCATION AND TRAINING

More powerful theories of knowledge and expertise are needed to move education and training beyond existing best practices. On this basis, IKIT has developed a knowledge-building pedagogy that puts ideas at the center and that moves problem-based learning to a new level.

BEYOND "BEST PRACTICE" IN KNOWLEDGEWARE

Ordinary knowledgeware allows knowledge to be shared and discussed but does nothing to support essential cognitive and social processes. Knowledge Forum® puts the community in charge of its own knowledge building and provides multiple supports to help it succeed.

BEYOND "BEST PRACTICE" IN KNOWLEDGE WORK

Whether in a classroom or an office, successful knowledge building requires collective cognitive responsibility. IKIT works with partners to design practices that foster collective cognitive responsibility and at the same time avoid work overload.

BEYOND "BEST PRACTICE" IN KNOWLEDGE-BUILDING COMMUNITY DEVELOPMENT

IKIT works with different public, private, professional, and service organizations to develop effective working relations not only within them but between them. The goal is symmetric knowledge advancement, where helping another group advance its knowledge also advances your own group's objectives.

IKIT is a new organization, but it grows out of a 25-year history of research-based innovation.

Indira Gandhi National Open University

The Indira Gandhi National Open University was established by an Act of Parliament in 1985. Today, it serves the educational aspirations of about 2 million students in India and 33 countries abroad through 21 Schools of Studies and an elaborate network of 59 regional centres, more than 2300 study centres, and around 41 overseas centres. The University is making all efforts to take higher education to the doorsteps of the hitherto unreached. Apart from teaching and research, extension and training form the mainstay of its academic activities. It also acts as a national resource centre; and more importantly,

functions as an apex body to promote and maintain standards of distance education. Based on its contribution in Distance Education the Commonwealth of Learning has recognised it as one of its 'Centres of Excellence'. It also has the unique privilege of hosting the Secretariats of SAARC Consortium of Open Distance Learning (SACODIL) approved by Heads of Governments of SAARC Nations and Global Mega Universities Network (GMUNET) initially promoted by UNESCO.

In order to fulfil the vision of democratising higher education and providing access to all segments of people, the University:

- Imparts education and knowledge through various flexible means suited to the open and distance education mode, including information and communication technologies.
- Provides higher education and training to large sections of population, particularly the disadvantaged segments of the society.
- Promotes national integration and the integrated development of human personality.
- Encourages, co-ordinates and assists open universities and distance learning systems to improve standards in such systems.

The University offers 175 (as of January 2009) academic programmes that are need-based, innovative and vocation-oriented with a focus on socio-economic development and serving the disadvantaged. The programmes are at the awareness, certificate, diploma, degree (Bachelors, Masters & Doctoral) levels and offered through multiple instructional package with the convergence of different methodologies and technologies.

IGNOU is the largest Open University and fifth largest University in the World.

OER Africa

OER Africa is an innovative initiative established by the South African Institute for Distance Education (*Saide*) to play a leading role in driving the development and use of Open Educational Resources (OER) across all education sectors on the African continent.

With seed funding from the William and Flora Hewlett Foundation and a wide variety of projects and partnerships running across Africa, *Saide* is – through its *OER Africa* initiative – providing a unique opportunity to deploy African expertise to harness the concept of OER to the benefit of education systems on the continent and around the world.

Over the next three years, *OER Africa* will seek to respond to specific problems faced by the higher education sector in Africa, notably a dearth of resources and increased student enrolments, contributing to over-stretched faculties. These have generated a growing urgency to meet the demands of students (and faculty) for improved pedagogical content and practice, as well as the demands of African societies for competent higher education

graduates. In response, *OER Africa* has successfully sought financial assistance to enable it to:

- raise awareness amongst African higher education institutions about the benefits of OER;
- support collaborative OER development, adaptation, and implementation processes within faculties, courses, or programs;
- offer practical support in the elaboration of OER policy frameworks at institutional, national, regional and continental levels;
- implement a research agenda focused on OER in African higher education; and,
- maintain and grow www.erafrica.org as a web platform for OER in Africa.

OER Africa continues to work with its growing network of partners to build upon and implement projects that will enable African academics and universities to harness the power of OER, develop their own capacity, and become integrated into global OER networks as active participants rather than passive consumers. In this way, *OER Africa* will contribute to building vibrant, sustainable African higher education institutions that play a critical role in building and sustaining African societies and economies, by producing the continent's future intellectual leaders through free and open development and sharing of common intellectual capital.

Strathmore University

Strathmore University is a leading not-for profit private university operating in Kenya, which aims at serving the Kenyan society to the best of its ability. Specialising in commerce and information technology, Strathmore holds a peerless reputation for quality in both academic and professional education and personal formation.

The Strathmore Motto "Ut omnes unum sint" is Latin which means "That all may be one". It expresses our desire to work together towards the same aim, in spite of personal differences or opinion, tastes and backgrounds.

Strathmore University hosts a highly successful Mobile Boot Camp. The Boot camp, an annual event, is organized by the Strathmore University Faculty of IT with support from various partners and aims at fostering the development of new applications for mobile phone users within the Kenyan context . It specifically seeks to create awareness of current mobile technology developments, comprehensively discuss mobile technological tools available for application developers and develop mobile applications skills among participants. From the camp, the individual/team that develops the best application(s) is awarded. The event consists of both theoretical and practical sessions whereby participants gain an insight into the telecom world and Mobile Application Development. The camp has led to a number of highly successful applications.

University of Capetown

Mission

UCT aspires to become a premier academic meeting point between South Africa, the rest of Africa and the world. Taking advantage of expanding global networks and our distinct vantage point in Africa, we are committed, through innovative research and scholarship, to grapple with the key issues of our natural and social worlds. We aim to produce graduates whose qualifications are internationally recognised and locally applicable, underpinned by values of engaged citizenship and social justice. UCT will promote diversity and transformation within our institution and beyond, including growing the next generation of academics.

Foundation statement underpinning the mission statement

Our research-led identity is shaped by a commitment to:

- academic freedom as the prerequisite to fostering intellectual debate and free inquiry;
- ensuring that research informs all our activities including teaching, learning and service to the community;
- advancing and disseminating knowledge that addresses the key challenges facing society - South African, continental and global;
- protecting curiosity driven research;
- nurturing and valuing creativity in the sciences and arts including the performing and creative arts;
- stimulating international linkages of researchers and research groupings.

We strive to provide a superior quality educational experience for undergraduate and postgraduate students through:

- providing an intellectually and socially stimulating environment;
- inspired and dedicated teaching and learning;
- exposure to the excitement of creating new knowledge;
- stimulating the love of lifelong learning;
- the cultivation of competencies for global citizenship;
- supporting programmes that stimulate the social consciousness of students;
- offering access to courses outside the conventional curricula;
- attracting a culturally and internationally diverse community of scholars;
- guaranteeing internationally competitive qualifications;
- offering a rich array of social, cultural, sporting and leadership opportunities;
- providing an enabling physical and operational environment.

In advancing UCT as an Afropolitan university, we will

- expand our expertise on Africa and offer it to the world;
- extend our networks on the continent, along with our global connections and partnerships;
- promote student and staff exchanges and collaborative research and postgraduate programmes;
- engage critically with Africa's intellectuals and world views in teaching and research;
- contribute to strengthening higher education on our continent.

We strive to provide an environment for our diverse student and staff community that:

- promotes a more equitable and non-racial society;

- supports redress in regard to past injustices;
- is affirming and inclusive of all staff and students and promotes diversity in demographics, skills and backgrounds;
- offers individual development opportunities to all staff;
- is welcoming as a meeting space for scholars from Africa and around the world.

IPTI

The Research Institute for Technology and Innovation (IPTI) was created in October 2003 as a non-profit research institution aiming to be a center for studies, research and services in the field of Technology and Innovation. IPTI initiated its activities in April 2004 and its main office is located in the city of São Paulo, at São Luís avenue, downtown. IPTI's focus is on projects that aggregate innovation, technology and human processes, searching to look at them always under a multidisciplinary perspective. IPTI's research team is composed by specialists from areas like architecture, engineering, neuroscience, informatics, law and statistics. Nowadays this team has 11 researchers, besides a technical team composed by 10 people. IPTI has also a strong network of partners and specialists, which are involved on projects depending on each demand. As examples of projects conducted by IPTI we can mention:

- Digital Culture (Brazilian Ministry of Culture - MinC)
- Culture and Entrepreneurship (IEL - SESI - MinC)
- Virtual Learning and Collaborative Environments (FAPESP - CNPq - European Commission)

The financial sustainability model adopted by IPTI is based on the institutional capacity for offering services, develop and coordinate projects. For doing so, its researchers are always trying to align scientific investigation with entrepreneurship, developing researchers in syntonny with the market and/or society needs. All IPTI's profit is destined to compose 3 financial funds: 1) expenditure fund, focused on assuring the institutional financial sustainability in periods of low activities; 2) investment fund, dedicated to cover expenses in prospecting new business; 3) research fund, aimed to finance the institutional research activities. The logic of this model is funding a virtuous cycle of research, innovation and services by considering this as the only manner to assure a permanent competitiveness, which is an essential condition in its policy of financial sustainability. To reach this aim, besides utilizing using own resources, IPTI also makes use of traditional research funds from national and international funding agencies. Nowadays IPTI has projects financed by FAPESP, by CNPq and by the European Commission.

IPTI adopts a policy of free knowledge in all activities the institution is involved, mainly (in special) in those ones financed by own resources and/or public funds. This policy is perfectly aligned with the model proposed for The Human Project and the antecedents from IPTI prove the financial and economical feasibility of this model. When IPTI was founded the creation of a graduate program was already part of its business plan. To keep (an equilibrium) balance between research activities that are expensive and generate

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FLOE Project
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return in medium or long terms and services activities that bring immediate return but leave few time for the researchers to dedicate to research, is a very complex task. In this sense, IPTI considers the graduate program as vital and the only possibility the institution can extend its capacity to develop research and innovation.

Appendix 3: Technical Activity Details and Timeline

Accessible Application Development with Infusion

[Infusion](#) provides highly accessible tools for creating flexible and loosely coupled applications that support UI Options and more out of the box. In particular, this work will enhance the ease of use of building applications and interactive Web sites with Infusion, as well as extending [Fluid's library of components](#) to include support for multimedia and accessible authoring.

UI Options

- * Promote [UI Options](#) to production status
- * Make UI Option more modular
- * Design and implement screens for layout and media preferences
- * Extend UI Options to transform third-party skins and CSS

Video Player

- * Add support for playing audio with HTML 5
- * Improve support for synchronized captions in VideoPlayer, including harmonization with emerging HTML 5 captioning standards
- * Add the ability to display transcripts and descriptions alongside a video
- * Promote VideoPlayer to production status

Uploader

- * Add support for HTML 5 multiple file uploads (Flash-based uploads supported on IE)
- * Improve support for user-friendly error messages
- * Promote [Uploader](#) to production status

Metadata Components

- * Content Metadata component: Design and implement a component that gently prompts users to specify content metadata (modalities used, control strategies, etc.)
- * Content Linker and Describer component: Design and implement a component that allows users to describe content and link it with available alternatives, inline or available on the Web
 - alternatives will include transcripts, descriptions, captions, and other media
 - users may also be able to identify particular content of interest on pages to support simplification and transformation

Framework

- * Extend Infusion's [Renderer](#) and framework features to support the creation of more flexible application UIs for OER
- * Simplify use of the Renderer, providing accessible and unobtrusive template-

based rendering for JavaScript applications

- * Implement planned Infusion IoC system, enabling user interfaces to be more easily separated and augmented
- * Implement a new component instantiation/rendering workflow, to enable UI transformations

Integration and Adoption of Infusion

- * Improve support for graceful degradation and simplified alternatives where appropriate
- * Create new and improved demos for all components, making it easier to learn and use Infusion
- * Write improved documentation and tutorials for components and framework features

Rich Transformation of Document-Based Data Feeds

FLOE will produce Web-based services that can transform and adapt structured document-based content based on the needs and preferences of a user. These transformations will leverage the infrastructure of Infusion to produce alternative renderings of XML, simple HTML, and other structured formats produced by authoring and content management systems from data feeds.

Document Transformer

- * Implement new preferences and transformations for delivering document-based content (e.g. blogs, lessons, eBook material), including the ability to transform:
 - column widths and overall page flow (e.g. optimized for mobile, large print, etc.)
 - simplified layouts
 - alternative locations for common presentational elements (e.g. headers, footers, and navigation)
- * Implement new preferences and transformations to deliver document-based content to mobile devices, including:
 - Themes, layout reflow, and simplification for smart phones such as iPhone and Android
 - Server-side transformation and basic search via SMS or WAP for older or "non-smart" phones

Integration and Adoption

- * Integrate structured document transformation features into WordPress or other popular authoring tool/content management system
- * Create tutorials and examples for integrating document-based transformation into other applications and content management systems

Media Enhancement

With [OpenCaps](#), media authors will be able to enhance their content by adding captions, transcripts, audio descriptions, and other alternatives. Similarly, learners will be able to customize the delivery of multimedia content, ensuring that it can be fully perceived and experienced by a wide variety of users.

Media Inspector

- * Design and implement a service that is capable of determining the structure of video and HTML content, automatically creating content metadata for it
- * Formats supported may include HTML 5, Flash Video, and Quicktime

Media Enhancer

- * Create a service that will deliver audio, video, and image content bundled with appropriate alternatives within a suitable component or player (such as the Infusion VideoPlayer). Alternatives may include:
 - Alternatives to audio (captions, transcripts, ASL)
 - Alternatives to visual (audio and text descriptions)
 - No images or animations

Accessible Media Creation: OpenCaps

- * Extend OpenCaps to include support for captioning HTML 5 and Flash videos
- * Improve the user experience of captioning with OpenCaps
- * Implement the ability to record and synchronize audio descriptions with supported videos
- * Design and implement a caption layout editor, enabling users to customize the location and styling of captions
- * Implement an embeddable OpenCaps Lite as an Infusion component, integrating it with the VideoPlayer component to enable community-contributed captions
- * Incubate OpenCaps as Fluid community product

Standards and Interoperability

FLOE will develop and support open standards such as AccessForAll, and create an architecture that fits well with the openness and distributed design of the Web. This will enable a diverse range of systems to share common formats and semantics for content metadata and accessibility preferences, as well as the ability to search and retrieve content, metadata, and preferences across systems.

Web-based Metadata and Preferences Storage

- * Specify and implement JSON bindings for AccessForAll, enabling preferences and metadata to be easily used across a wide variety of Web-enabled systems
- * Define a lightweight spec for storing, searching, and retrieving content metadata and user preferences using Web standards such as REST

- * Create a reference implementation of metadata and preferences repository using CouchDB or a similar Web-enabled database

Metadata Search and Preferences Matcher

- * Create a simple search engine for querying content metadata across distributed repositories
- * Define a Matcher, responsible for discovering appropriate content based on user preferences

Browser-based Preferences

- * Enable users to store their preferences directly in their browser, via a browser extension or local data storage

Fostering a Community for OER Accessibility

To support the growing interest in contributing to OER accessibility, FLOE will help provide content authors, teachers, and learners with effective techniques for inclusive design.

Community Accessibility Forum

- * Design and implement a simple forum for connecting the need for alternative content with potential creators of such alternatives
- * Extend components such as VideoPlayer and Metadata search to allow users to directly request accessibility help via the forum (e.g. "Can anyone caption this great video for me?")

Design Handbook

- * Produce a refreshed version of the [Fluid Design Handbook](#), providing tips, techniques, and tools for designing accessible and usable content. This material will include:
 - Stories and real-world examples of how to design inclusively
 - Tutorials for conducting a user test, doing design research, and assessing accessibility and usability
 - More illustrations (with alternatives)

Accessibility Evangelism & Support

- * Refine and publish materials for an inclusive design training workshop
- * Create videos, posters, and marketing material to increase awareness of inclusive design issues in OER (including a Mozilla Drumbeat project)

Q1 July-Sept 2010	Q2 Oct-Dec 2010	Q3 Jan-Mar 2011	Q4 April-June 2011
<i>UI Options</i>	<i>Infusion and AccessForAll</i>	<i>Document Transformer</i>	<i>Documentation</i>
Extend UI Options to transform third-party skins and CSS	Implement Infusion IoC system	Implement transformations for delivering document-based content	Create tutorials and documentation for integrating Document Transformer
Make UI Options more modular	Implement Web-based preferences and metadata storage	Implement a new Infusion component instantiation/rendering workflow	New demos and tutorials for UI Options and other components
Promote UI Options to production status	Define and share specification for sharing, searching and retrieving metadata/preferences via the Web	Design and implement UI Options preferences screens for document layout	Enhancements to Infusion VideoPlayer component
Simplify use of the Renderer	Begin design work on document transformer	Prototype integration of Document Transformer into CMS or authoring tool such as WordPress	Refine integration of Document Transformer into CMS or authoring tool
Initiate ongoing community support of inclusive design in OER		Extend design work on UI Options and Document Transformer	
Begin a review of previous design work on UI Options in anticipation of new features			
Ongoing community support, participatory design, testing and release of software products			

Q5 July-Sept 2011	Q6 Oct-Dec 2011	Q7 Jan-Mar 2012	Q8 April-June 2012
<i>Media and OpenCaps</i>	<i>More media</i>	<i>Mobile Transformation</i>	<i>Authoring and Metadata</i>
Extend OpenCaps to include support for captioning HTML 5 and Flash videos Improve the user experience of captioning with OpenCaps	Refinement of Media Enhancer Implement Media Inspector	Add support to Document Transformer for mobile transformations Refine and improve mobile Fluid Skinning System	Enhancements to Infusion Uploader component Implement prototype metadata/authoring components
Implement prototype Media Enhancer	Extend OpenCaps with support for audio descriptions	Add mobile preferences to UI Options	Integrate metadata/authoring components with Uploader or other components
Design and implement UI Options preferences screens for media	Work to integrate design work for UI Options, Document Transformer, and Media Inspector	Improvements to Fluid Kettle server-side mobile framework	
Begin design research for Media Enhancer			
Ongoing community support, participatory design, testing and release of software products			

Q9 July-Sept 2012	Q10 Oct-Dec 2012	Q3 Jan-Mar 2013	Q4 April-June 2013
<i>More Authoring and Metadata</i>	<i>Tying it all together</i>	<i>Documentation and Tutorials</i>	<i>Community</i>
Refine metadata/authoring components	Refine metadata/preferences Search and Matcher	More demos and tutorials for Infusion and other work produced	Design and implement community accessibility forum
Implement prototype metadata/preferences Search	Add support for browser-based user preferences storage	Improved graceful degradation support for Infusion and FLOE components	Rework and refine Fluid Inclusive Design Handbook
Implement prototype metadata/preferences Matcher	Implement caption layout editor in OpenCaps		
Ongoing: community support, participatory design, testing and release of software products			

Appendix 4: The Fluid Community

Fluid is an open-source software community that builds user interfaces, designs commonly used interactions, teaches user-centred design practices, advocates for an open, flexible, and accessible web, and works with software communities to integrate these solutions.

The core focuses of the Fluid community are usability and accessibility and harnessing the capabilities of the web to deliver great applications that incorporate both. The community makes web development, advocacy, and teaching materials available to everyone. All of the community's work is open source, inclusive, transparent, and highly collaborative.

For example, [Fluid Design Handbook](#) is a product that helps people working on the web learn about user-centered design through examples, templates, and activities for improving web-based solutions. [Fluid Infusion](#) is a code product that bundles commonly-experienced interactions (like drag and drop) into easy-to-implement code.

The community works in a number of domains including higher education web applications, digitization products, and museum solutions. The main goal in all these activities is to improve the users' experience with web applications, to achieve greater accessibility with web solutions, and to teach others how to improve their work to accomplish these goals.

Through deeply collaborative work (coupled with open processes that include open architecture, open web development and design approaches), the Fluid community aims to transform the web to better fit the personalized needs and preferences of each user.

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