

APRIL 11°, 2019



GEORG ECKERT  
INSTITUT

Leibniz-Institut für  
internationale  
Schulbuchforschung



# KNOWLEDGE ORGANISATION FOR DIGITAL INFRASTRUCTURES (APPLYING DAHLBERG'S ICC IN A LOD ENVIRONMENT)

9° MEETING - ISKO ITALIA  
BIBLIOTECA NAZIONALE CENTRALE DI FIRENZE. SALA GALILEO  
PIAZZA DEI CAVALLEGGERI 1, FIRENZE

ERNESTO WILLIAM DE LUCA

Mitglied der  
*Leibniz*  
Leibniz-Gemeinschaft

# ABOUT ME

Head of Department

*Digital Information and Research Infrastructure (DIRI)*

- Georg Eckert Institute for International Textbook Research (GEI)  
Member of the Leibniz Association, Germany  
(Since 04/2015)

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Associate Professor for Computational Engineering

- Guglielmo Marconi University in Rome, Italy  
(Since 05/2015)



Associate Professor for Information Science

- Potsdam University of Applied Sciences, Germany  
(10/2012-09/2017)



# ISKO CHAPTER - SINCE 01/2019 (GERMANY + AUSTRIA + SWITZERLAND)

- Chair: Ernesto William De Luca  
(Georg Eckert Institute, Braunschweig)
- Vice-Chair: Ivo Keller  
(Brandenburg University of Applied Sciences)
- Treasurer: Lena-Luise Stahn  
(Free University of Berlin)
- Co-opted: Christian Wartena, Peter Ohly
- Website: [www.isko-de.org/](http://www.isko-de.org/)



# AGENDA

- Georg Eckert Institute (GEI)
- Digital Information and Research Infrastructures
- Integrating ICC in an LOD Environment
- Conclusions

# AGENDA

- Georg Eckert Institute (GEI)
  - History
  - Organization
  - Why Textbook Research?
- Digital Information and Research Infrastructures
- Integrating ICC in an LOD Environment
- Conclusions

# GEORG ECKERT INSTITUTE HISTORY



Georg Eckert und Władysław Markiewicz  
gründen die Deutsch-Polnische  
Schulbuchkommission

**1951** "International Institute for Textbook Improvement"

**1975** Foundation of the Georg Eckert Institute in its present form

**1985** UNESCO Prize for Peace Education

**2003** crisis country financing

**2006** Application federal-state funding (Niedersächsisches MWK)

**2008** Evaluation by the Science Council (Wissenschaftsrat)

**2009** international "Lighthouse" Institution → Admission to the federal-state funding

**2011** Member of the Leibniz Association

# GEORG ECKERT INSTITUTE ORGANIZATION

- Institute
  - 140 employees
- Library
  - ~180000 textbooks
  - ~80000 scientific works



# GEORG ECKERT INSTITUTE

## WHY TEXTBOOK RESEARCH?

- History of knowledge
- Historical education (media) research
- Historical children's literature research
- Educational Media Research

"The core of the GEI's work is international comparison of social images of self, other and enemy that are transmitted through textbooks and other school relevant educational media. Special emphasis is placed on fields such as history, geography and social studies/politics."



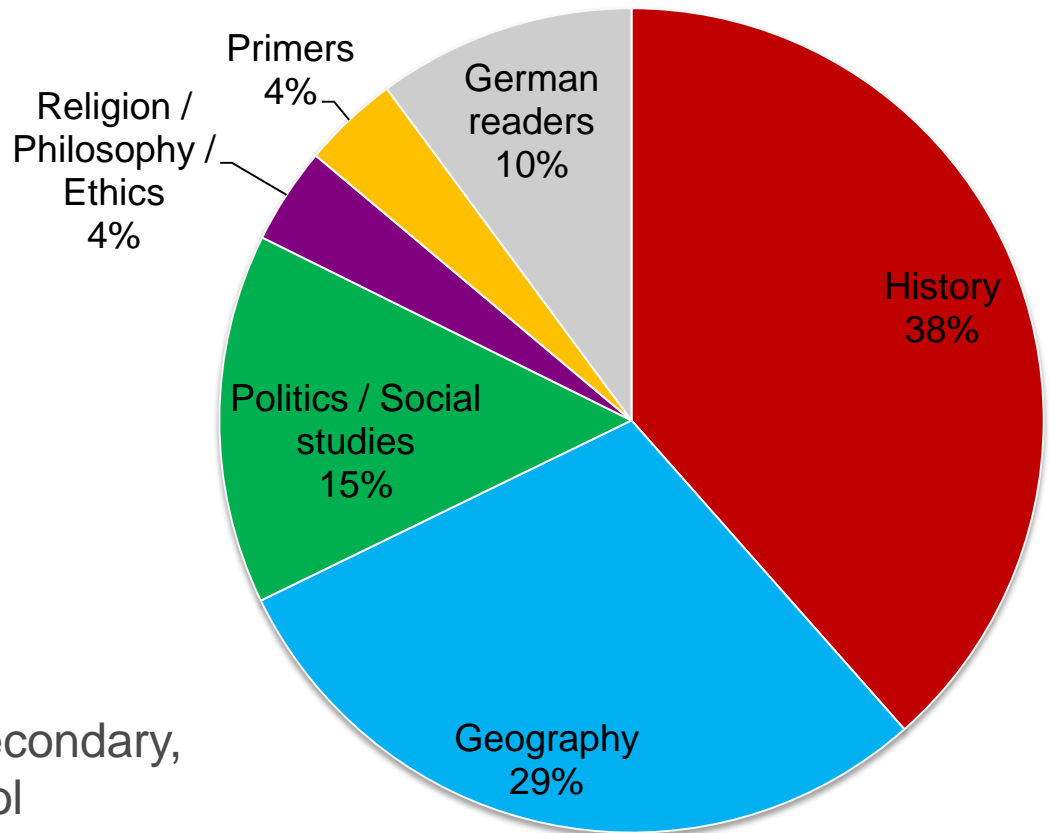
# GEORG ECKERT INSTITUTE

## WHAT ARE OUR SUBJECTS AND SCHOOL TYPES?

- History
- Geography
- Politics/Social studies
- Religion/Philosophy/Ethics
- Primers
- German readers

### School types:

- primary, secondary, upper secondary, general and vocational school



GEORG ECKERT INSTITUTE

## WHAT IS KNOWLEDGE ORGANIZATION?

Traditional knowledge organization focusses on the **description** and **organization of knowledge in libraries**, archives, databases, scientific domains, etc.

With modern communication techniques users expect **knowledge to be available and instantly accessible from different sources, different disciplines** and different sectors of society.

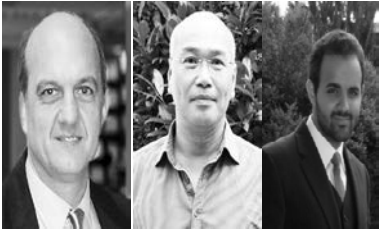
# AGENDA

- Georg Eckert Institute (GEI)
- Digital Information and Research Infrastructures
  - Department DIRI
  - Challenges
- Integrating ICC in an LOD Environment
- Conclusions

# DEPARTMENT DIRI



## Information Technology (IT)



## Information Services



## Data Management



## Digital Humanities



## Knowledge Organization and Information Retrieval



Department Digital Information and Research Infrastructures (DIRI)

# DEPARTMENT DIRI RESEARCH TOPICS

## Information science (method development and evaluation)

- Topic Modeling
- Opinion Mining
- Semantic analysis
- Ontology development
- Knowledge Organisation

### History

- Classical hermeneutics
- Discourse analysis
- Historical semantics



## Computer Science and Digital Humanities

- Quantitative digital Analysis
- Information Retrieval
- Natural Language Processing
- Named Entity Recognition
- Classification and Clustering
- Web-based interface for interactive text search and analysis with standard tools (Apache-Solr)

# CHALLENGES ASSUMPTIONS FOR TEXTBOOK RESEARCH

- The information need is based on
  - properties of textbooks
  - the occurrence of certain search terms / key words in the text
  - user needs
- Faceted Search (Browsing)
  - to reduce the result set
- Disambiguation
  - Difficult as tags were allocated ambiguously
- Multilingualism
  - Different monolingual resources can not be searched in multiple languages

# CHALLENGES INFORMATION INFRASTRUCTURES

## Databases and data formats

- linking
- analysis
- visualization
- searches
- methods of DH

25 Treffer zu Ihrer Suche

Einträge pro Seite 10

Niedersachsen, Kultusministerium  
**Kerncurriculum für die Hauptschule, Schuljahrgänge 7 - 10 - Politik**  
Sachgebiete Deutschland, Niedersachsen | Sozialkunde/Politik | ISCED 2 - Sekundarstufe 1 | Hauptschule  
Ausgabe Anhörfassung, [Stand.] Januar 2015  
Download [PDF Lehrplan](#) (450KB)  
CURRICULA\WORKSTATION

Johannes Derichs, Hans Ebeling, Wolfgang Birkenfeld  
**Begegnungen - Geschichte, Sozialkunde, Erdkunde**  
Teil 9, [Schülerbd.]  
Ausgabe Ausg. B, [für Hauptschulen in Bayern], 1. Aufl.  
Jahr 2007  
GEI|DZS

150 x 200  
Anderes Fach, 5./6. Schuljahr, Gymnasium  
**Abenteuer Ethik - Sekundarstufe I**  
Herausgeber Sänger, Monika  
Erschienen C.C. Buchner, 2010  
ISBN 978-3-7661-6645-6  
Geeignet für Baden-Württemberg, Berlin, Brandenburg, Bremen, Hamburg, Mecklenburg-Vorpommern, Rheinland-Pfalz, Sachsen-Anhalt, Schleswig-Holstein, Thüringen  
Rezensiert von Barbara Beispiel, 2. Mai 2015  
EDU|REVIEWS

6. Juni 2015 - Digital Humanities  
**Bessere Schulleistungen dank Handyverbot**  
Eine Studie des Centre for Economic Performance der London School of Economics belegte nun, dass ein absolutes Handyverbot in der Schule die Leistungen von Schülern verbessert – vor allem die von Schülern aus finanzschwachen Verhältnissen mit unterdurchschnittlichen Schulleistungen.  
EDU|NEWS

Zurück 1 2 3 4 5 6 Weiter | Alle anzeigen

# CHALLENGES INFORMATION INFRASTRUCTURES

## Faceted Browsing

### INT|TEXTBOOKCAT

Land	Unterrichtsfach	Bildungsebene
Afrika (länderübergreifend) Albanien Argentinien Armenien Australien Belgien Bosnien-Herzegowina Brasilien	Deutsch im Ausland Erstleseunterricht - Fibeln Ethik Geographie Geographie - Atlas Geschichte Geschichte - Atlas Muttersprache - Lesebücher	ISCED 1 - Primarbereich ISCED 2 - Sekundarstufe I ISCED 3 - Sekundarstufe II ISCED 5 - Tertiärbereich Berufliche Bildung, alle Lernstufen Sonstige Lehrmittel Lehrerbildung
Zeitspanne	Bundesland (Deutschland)	Schulform
1871 - 1918 (Deutschland) 1900 - 1944 1919 - 1932 (Deutschland) 1933 - 1944 (Deutschland) 1945 - 1949 1950 - 1959 1960 - 1969 1970 - 1979	Baden-Württemberg Bayern Nordrhein-Westfalen Niedersachsen Rheinland-Pfalz Sachsen Hessen Berlin	Gymnasium Hauptschule Realschule Gesamtschule Sonderpädagogische Schulformen Schularten mit 2 Bildungsgängen Grundschule Berufliche Schule
Signatur	Sprache	Format
G - Geographie D - Weltgeschichte S - Landwirtschaft, Agrarwissenschaften, Versuchstierkunde H - Sozial- und Wirtschaftswissenschaften N - Kunst A - Allgemeines P - Linguistik, Philologie	deutsch englisch französisch italienisch niederländisch spanisch schwedisch polnisch	Bücher Gedruckte Bücher Elektronische Ressource Elektronische Bücher Karten Aufsätze Gedruckte Aufsätze Datenträger

### EDU|REVIEWS

**Schulfach**  
— Bitte wählen —

**Schulart**  
— Bitte wählen —

**Schulstufe**  
— Bitte wählen —

**Bundesland**  
— Bitte wählen —

**Erscheinungsjahr**  
— Bitte wählen —

### gei.digital

Die digitale Schulbuch-Bibliothek

**Sort by**

Persons >

Title >

Import date >

Year of publication >

**Structure type**

Chapter (119) >

Table (3) >

Monograph (3) >

Expand +

### EDU|NEWS

--- Alle ---

--- Alle ---

Nachricht (2484)

Veranstaltung (954)

### EDU|DATA

### zwischenräume

Materialien für Vielfalt im Klassenzimmer

**Education System**

no preference  central  federal

**Curricula**

no preference  yes  no

**Textbook Production**

no preference  state  private

**Textbook Authors**

School teacher  University teacher  Ministry official  Other

**Textbook Formats**

digital  print

**Approval of Textbooks**

no preference  yes  no

**Textbook Selection**

Teacher  School  Ministry

**Provision of Textbooks**

Free of charge  Fee  Purchase

**Teacher Training**

theoretical  practical  other

Reset all filters

#### INHALTSTYP

- + Unterrichtsmodul (28)
- + Material (22)

#### SCHULFÄCHER

- + Politische Bildung (14)
- + Geschichte (12)
- + Ethik/Religion (9)
- + Geographie (2)
- + Deutsch (1)

#### SCHULFORM

- + Gymnasium (25)
- + Gesamtschule (25)
- + Realschule (23)
- + Hauptschule (21)

#### SCHULSTUFE

- + 10. Klasse (26)
- + 9. Klasse (21)
- + 11. Klasse (15)
- + 12. Klasse (14)
- + 8. Klasse (6)
- + 13. Klasse (1)

#### MATERIALTYP

- + Sachtext (13)
- + Arbeitsblatt (5)
- + Quelle (2)
- + Video (1)
- + Impuls (1)



# CHALLENGES INFORMATION INFRASTRUCTURES

## Standardization of Access (Information Search)

Library  
Catalogue



CW



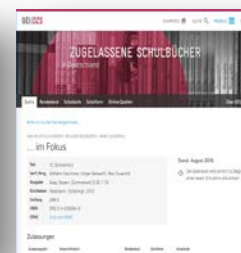
GEI.de



GEI-  
Digital



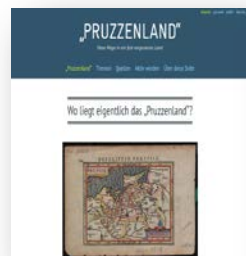
GEI|DZS



Zwischen-  
-töne



Pruzen-  
land



World-  
Views



edu.news



edu.data



edu.reviews



edu.docs



# CHALLENGES RESEARCH INFRASTRUCTURES

## Standardization of Access (Resources)



# AGENDA

- Georg Eckert Institute (GEI)
- Digital Information and Research Infrastructures
- Integrating ICC in an LOD Environment
  - Motivation
  - Harmonization of GEI Information Services
  - Consolidation of the Digital Infrastructures
  - Cooperating with Ingetraut Dahlberg
- Conclusions

# MOTIVATION

- Accessing the GEI Services is often made more difficult by
  - lack of knowledge,
  - too many different services,
  - necessary training in the tools, without knowing whether it is worthwhile.
- Missing serendipity

# HARMONIZATION OF GEI INFORMATION SERVICES

Bibliotheks-  
katalog



Search  
Index

CW



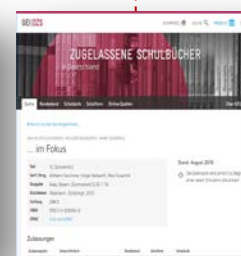
GEI.de



GEI-Digital



GEI|DZS



Zwischen-  
töne



Pruzen-  
land



World-  
Views



edu.news



edu.data



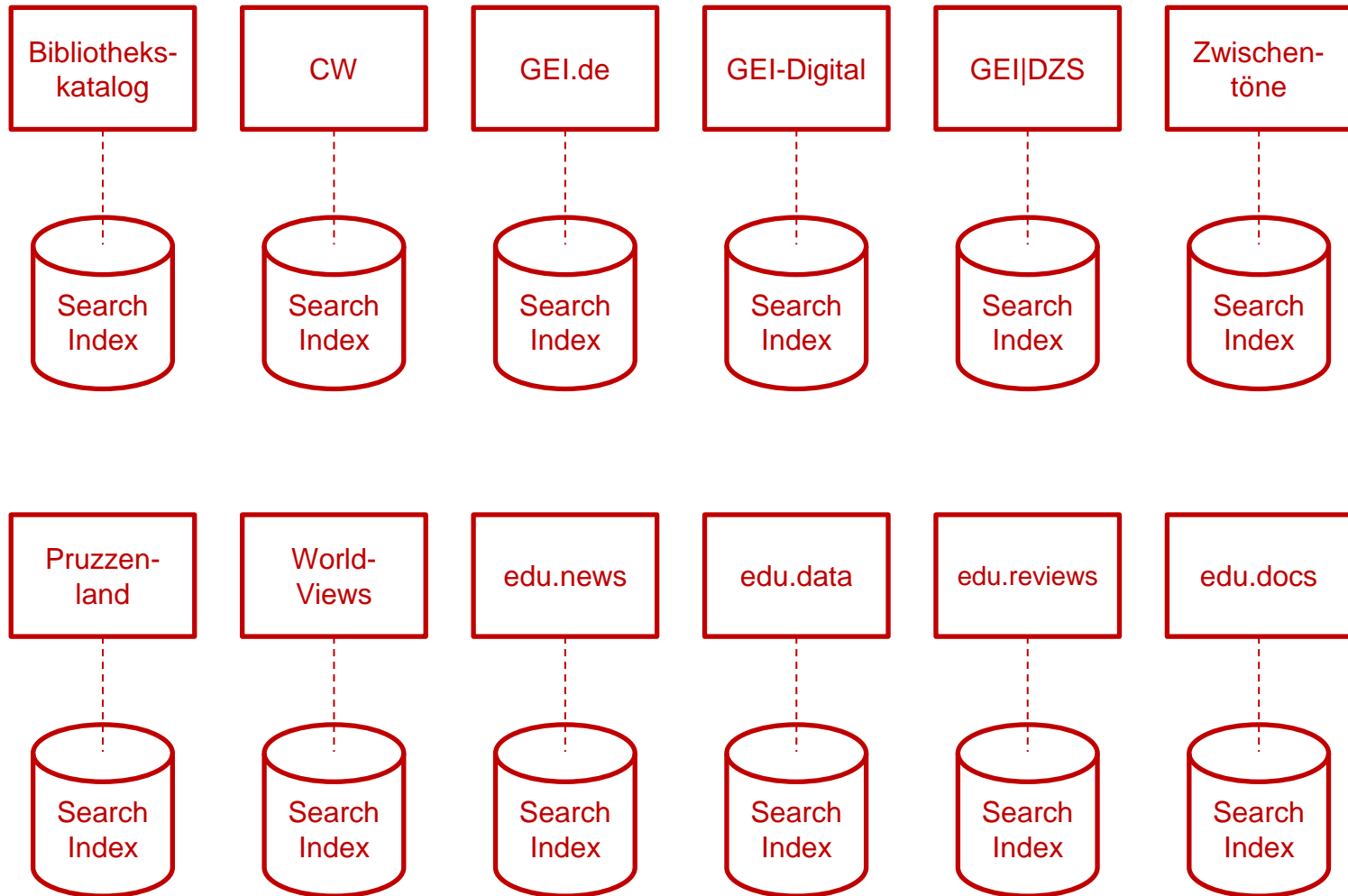
edu.reviews



edu.docs



# HARMONIZATION OF GEI INFORMATION SERVICES

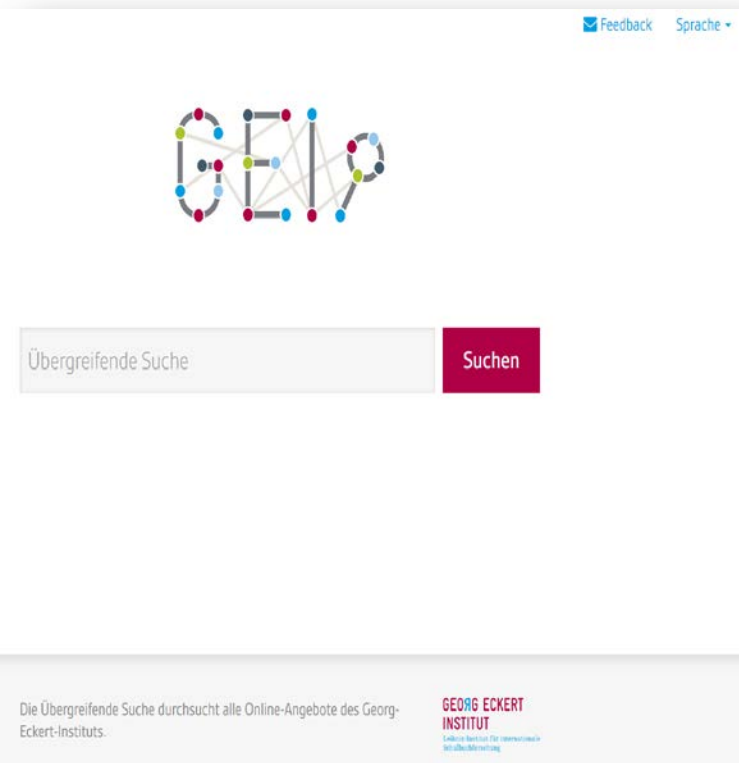


# HARMONIZATION OF GEI INFORMATION SERVICES


- Development of a meta search engine
  - as an alternative access to all GEI Services,
  - to think outside the box
  - but also as a search engine



# HARMONIZATION OF GEI INFORMATION SERVICES RESEARCH AND META SEARCH



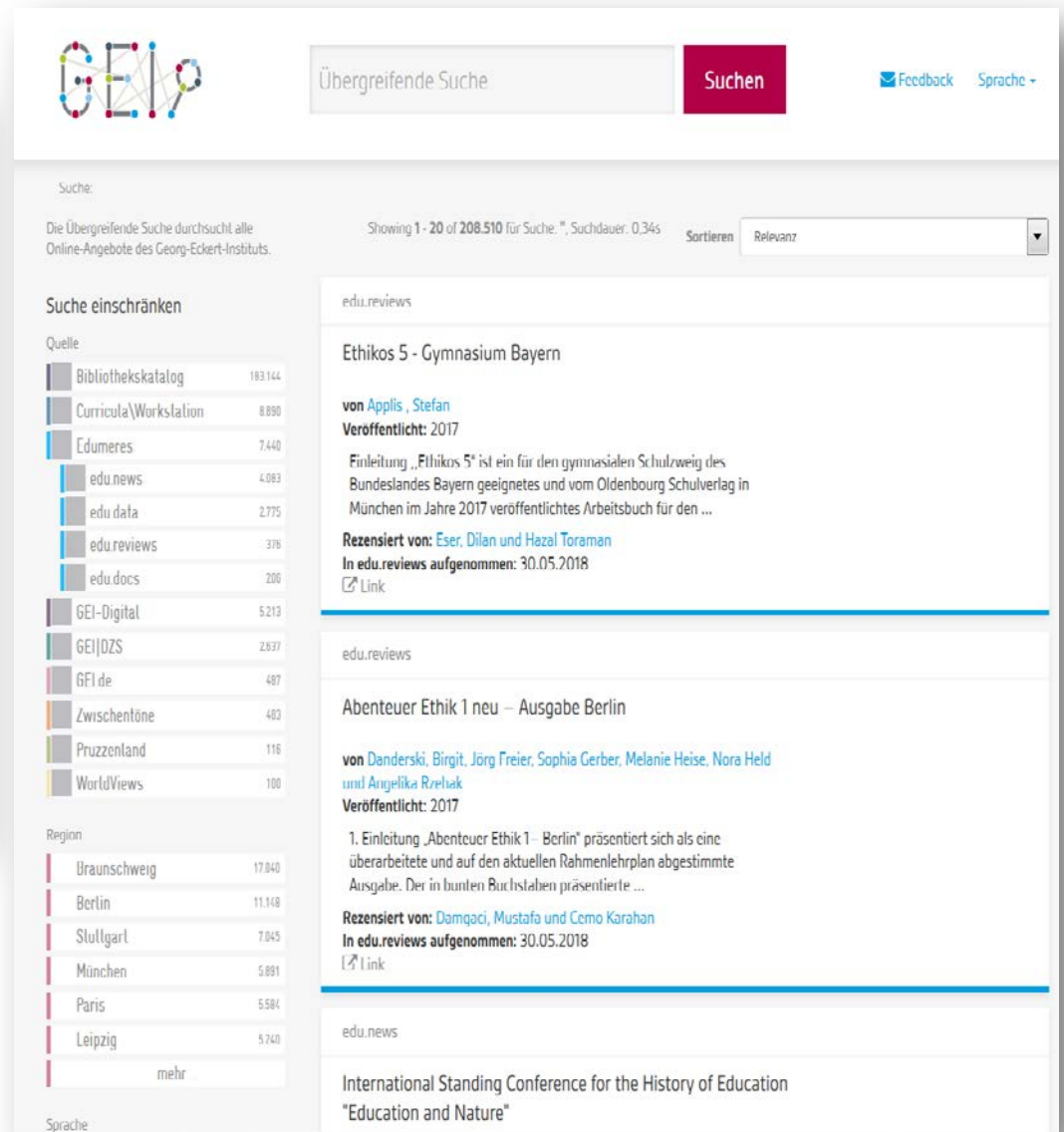
Feedback Sprache



Übergreifende Suche **Suchen**

Die Übergreifende Suche durchsucht alle Online-Angebote des Georg-Eckert-Instituts.

**GEORG ECKERT INSTITUT**  
Lehrerbildung für innovative Schulen  
Wissenschaftszentrum



GEI

Übergreifende Suche **Suchen** Feedback Sprache

Suche: Showing 1 - 20 of 208.510 für Suche: "", Suchdauer: 0,34s Sortieren Relevanz

Suche einschränken

Quelle

Bibliothekskatalog	183.144
Curricula/Workstation	8.890
Edumeres	7.440
edu.news	4.083
edu.data	2.775
edu.reviews	376
edu.docs	206
GEI-Digital	5.213
GEI DZS	2.837
GFI.de	487
Zwischentöne	402
Pruzenland	116
WorldViews	100

Region

Braunschweig	17.040
Berlin	11.148
Stuttgart	7.045
München	5.891
Paris	5.584
Leipzig	5.740
mehr	

Sprache

edu.reviews

**Ethikos 5 - Gymnasium Bayern**

von [Applis, Stefan](#)  
Veröffentlicht: 2017

Einleitung „Ethikos 5“ ist ein für den gymnasialen Schulzweig des Bundeslandes Bayern geeignetes und vom Oldenbourg Schulverlag in München im Jahre 2017 veröffentlichtes Arbeitsbuch für den ...

Rezensiert von: [Eser, Dilan und Hazal Toraman](#)  
In edu.reviews aufgenommen: 30.05.2018  
[Link](#)

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edu.reviews

**Abenteuer Ethik 1 neu – Ausgabe Berlin**

von [Danderski, Birgit, Jörg Freier, Sophia Gerber, Melanie Heise, Nora Held und Angelika Rzehak](#)  
Veröffentlicht: 2017

1. Einleitung „Abenteuer Ethik 1 – Berlin“ präsentiert sich als eine überarbeitete und auf den aktuellen Rahmenlehrplan abgestimmte Ausgabe. Der in bunten Buchstaben präsentierte ...

Rezensiert von: [Damqaci, Mustafa und Cemo Karahan](#)  
In edu.reviews aufgenommen: 30.05.2018  
[Link](#)

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edu.news

International Standing Conference for the History of Education  
"Education and Nature"



# CONSOLIDATION OF THE DIGITAL INFRASTRUCTURES

- Central middleware
  - as a repository for data retention and archiving
  - to harmonize the metadata schemas
  - with a common search index
  - and interfaces for data exchange
- Benefits for the future
  - Avoiding duplication of data and workloads
  - Improved usability and long-term availability

# CONSOLIDATION OF THE DIGITAL INFRASTRUCTURES

## Retrieval and Browsing

## Research

**International Textbook Collections**

System	Language	Format
G. Germany	deutsch	Scanned
D. Switzerland	deutsch	Scanned
L. Switzerland	deutsch	Scanned
A. Spain and Spanish-speaking countries	spanisch	Scanned
N. Spain	spanisch	Scanned
A. Singapore	deutsch	Scanned
F. Singapore	deutsch	Scanned

**Multilingual Digital Editions**

Overview: Digital Sources, Description, Fulltext, History of Education

Search: "Auf der Kolonie"

Source: Dr. Wilh. Rothemanns Lehrbuch für...

Categories: Sekundarstufe I, Geschichte, 1919-1925, Dokumente, Autorentyp, Ersteller

Keywords: Migration, Deutschland, Erstellen, 30. Jahrhundert, 19. Jahrhundert, Kultur, Zielkriter

EDU|MERES

**School Systems**

EDU DATA

TEXTBOOK SYSTEMS WORLDWIDE

Edu data - Textbook

Search by country

**Curricula**

CURRICULA WORKSTATION

LEHRPLÄNE WELTWEIT

geography

Citizenship

Search filters: Country, Subject, Education level

## Visualization

**Historical textbooks**  
(history, geography, politics, reading books)  
17th century - End of 1st World War 1918.

gei.digital

PLACES COMPARE TASS BOOKS

**Historical textbooks**  
(history, geography, politics, reading books)  
17th century - End of 1st World War 1918.

Welt der Kinder Explorer - Beta

Suche: gazal

Aktuelle Auswahl: Aufträge/Alte Tonaufg. gazal | Forschungsjahr: 1988 bis 1992 | um 50 Wörter um 3 Sat.

**Historical textbooks**  
(history, geography, politics, reading books)  
17th century - End of 1st World War 1918.

Titel	Verfasser	Verlag	Jahr	Seiten	Wörter
...	...	...	...	...	...

Einziges Wort: 454

Wählbare Lehranstalten: 223

Mittlere Lehranstalten: 722

Maximale Lehranstalten: 108

Zeitraumvergleich: Vergleich mit vorheriger Anfrage

**Experts**

EDU EXPERTS

De Luca Ernesto William

Personal Data

Expertise

# COOPERATING WITH INGETRAUT DAHLBERG



- Ernesto William De Luca. **Using Multilingual Lexical Resources for Extending the Linked Data Cloud.** 13. Tagung der Deutschen ISKO (International Society for Knowledge Organization). Theorie, Information und Organisation von Wissen. In cooperation with the 13th International Symposium for Information Science, Potsdam, Germany. 19.-20.3.2013.
- Ernesto William De Luca und Ingetraut Dahlberg. **Die Multilingual Lexical Linked Data Cloud: Eine mögliche Zugangsoptimierung?** In: Information - Wissenschaft & Praxis Band 65, Heft 4-5. 2014.
- Ernesto William De Luca and Ingetraut Dahlberg. **Including Knowledge Domains from the ICC into the Multilingual Lexical Linked Data Cloud.** 13th International Conference (ISKO 2014). Knowledge Organization in the 21st Century: Between Historical Patterns and Future Prospects. Krakow, Poland. 19.-22.5.2014.
- Lena-Luise Stahn, Ingetraut Dahlberg and Ernesto William De Luca. **Knowledge Organisation for Digital Libraries.** In: 17th European Networked Knowledge Organization Systems (NKOS) Workshop. During the 21st International Conference on Theory & Practice of Digital Libraries (TPDL 2017) in Thessaloniki, Greece.

# COOPERATING WITH INGETRAUT DAHLBERG

## SOLUTIONS – PRELIMINARY WORK

0 GENERAL FORM CONCEPTS	01 THEORIES; PRINCIPLES	02 OBJECTS; COMPONENTS	03 ACTIVITIES PROCESSES	04 PROPERTIES or 1 <sup>st</sup> kind of field specialty	05 PERSONS or 2 <sup>nd</sup> kind of Field specialty	06 INSTITUTIONS or 3 <sup>rd</sup> kind of field specialty	07 TECHNOLOGY & PRODUCTION	08 APPLICATION in other fields, DETERMINATION	09 DISTRIBUTION & SYNTHESIS
1 FORM & STRUCTURE AREA	11 Logic	12 Mathematics	13 Statistics	14 Systemology	15 Organization Science	16 Metrology	17 Cybernetics, Control & Automation	18 Standardization	19 Testing & Monitoring
2 MATTER & ENERGY AREA	21 Mechanics	22 Physics of Matter	23 'General & Technical Physics	24 Electronics	25 Physical Chemistry	26 Pure Chemistry	27 Chemical Technol. & Engineering	28 Energy Science & Technology	29 Electrical Engineering
3 COSMOS & EARTH AREA	31 Astronomy & Astrophysics	32 Astronautics & Space Research	33 Basic Geosciences	34 Atmospheric Sciences & Technology	35 Hydrospheric & Ocean. Science & Technology	36 Geological Sciences	37 Mining	38 Materials Science & Technology	39 Geography
4 BIO SPHERE	41 Basic Biological Sciences	42 Microbiology & Cultivation	43 Plant Biology & Cultivation	44 Animal Biology & Breeding	45 Veterinary Sciences	46 Agriculture & Horticulture	47 Forestry & Wood Science & Technology	48 Food Sciences & Technology	49 Ecology & Environment
5 HUMAN AREA	51 Human Biology	52 Health & Theor. Medicine	53 Pathology & Pract. Medicine	54 Clinical Medicine & Cure	55 Psychology	56 Education	57 Occupation, Labor & Leisure	58 Sports	59 Household & Home Life
6 SOCIETAL AREA	61 Sociology	62 State & Politics	63 Public Administration	64 Money & Finances	65 Social Assistance, Appraisal & Survey	66 Law & Legal Science	67 Areal Planification & Urbanism	68 Structure of Defense	69 History Science & History
7 ECONOMY & TECHNOLOGY AREA	71 General & National Economics	72 Applied Economics, Business Mgt.	73 Technical Sciences	74 Mechanical & Precision Engg.	75 Building & Civil Engineering	76 Science of Commodities & Technol. of Goods	77 Vehicle Science & Technology	78 Traffic & Transport. Techn. & Services	79 Service Economics
8 SCIENCE & INFORMATION AREA	81 Science of Science	82 Information Sciences	83 Computer Science	84 Information in general	85 Communication	86 Mass Communication	87 Printing & Publishing	88 Tele- communication	89 Semiotics
9 CULTURE AREA	91 Language & Linguistics	92 Literature & Philology	93 Music & Musicology	94 Fine Arts	95 Theatre	96 Culture Science (narrow sense)	97 Philosophy	98 Religion (in general)	99 Christian Religion & Theology

Copyright ICC 1982, rev. 2010 Dr. Ingetraut Dahlberg

24 ICC, first two levels, with Areas of Being („Seinsbereiche“) and 9 structuring aspects, forming the Subjects Groups („Sachgruppen“), English translation.

# COOPERATING WITH INGETRAUT DAHLBERG

## SOLUTIONS – PRELIMINARY WORK

### RDF/OWL for EuroWordNet (EWN)

- We developed an RDF/OWL schema and a method for converting EuroWordNet (De Luca et al. 2007) into Sematic Web-format (adapting RDF/OWL for Princeton WordNet (van Assem et al. 2004))

```
<ewn20schema:NounSynset rdf:about="&ewn20instances;synset-bank-noun-1"
  rdfs:label="bank">
  <ewn20schema:synsetId>102690337 </ewn20schema:synsetId>
</ewn20schema:NounSynset>
<ewn20schema:Word rdf:about="&ewn20instances;word-bank"
  ewn20schema:lexicalForm="bank"/>
<ewn20schema:NounWordSense rdf:about="&ewn20instances;wordsense-bank-noun-1"
  rdfs:label="bank">
  <ewn20schema:word rdf:resource="&ewn20instances;word-bank"/>
</ewn20schema:NounWordSense>
<rdf:Description rdf:about="&ewn20instances;synset-bank-noun-1">
  <ewn20schema:containsWordSense rdf:resource="&ewn20instances;wordsense-bank-noun-1"/>
  <ewn20schema:containsWordSense rdf:resource="&ewn20instances;wordsense-bank_building-noun-1"/>
</rdf:Description>
```

RDF/OWL EuroWordNet SynSet example

# COOPERATING WITH INGETRAUT DAHLBERG SOLUTIONS – PRELIMINARY WORK

Mutual approach (De Luca/Dahlberg 2014):

- ICC extension with EuroWordNet using the new RDF/OWL format
- ICC-EWN-mapping (theoretical level) RDF/OWL format adaptation (schema level)

-> Basis for presented approach

# COOPERATING WITH INGETRAUT DAHLBERG SOLUTIONS – PRELIMINARY WORK

Expected Results and further work:

- „Lexikon der Wissensgebiete“  
as a part of the Lexical Linked Data Cloud
  - Standardisation, converting it into RDF/OWL
  - Top Ontology with the Lexical Resource WordNet Domains
- Different Use Case Scenarios



# COOPERATING WITH INGETRAUT DAHLBERG SOLUTIONS - ICC – LOD ENVIRONMENT

In order to extend ICC with the RDF/OWL EuroWordNet we use a two steps approach:

- Conversion from the ICC format to the EuroWordNet OWL format
- Integration of the converted data in the EuroWordNet OWL hierarchy

Before converting the ICC Knowledge Domains, we mapped every single domain to the corresponding WordNet Domain as presented here. These mappings give us the possibility to add the new knowledge on the top of the EuroWordNet hierarchy.

TOP-LEVEL	BASIC DOMAINS	DDC CODES	ICC CODES
Humanities			
	History	[920:990]	[69]
	Linguistics	410	[91]
	Literature	[800, 400]	[92]
	Philosophy	[100-(130, 150, 176)]	[97]
	Psychology	150	[55]
	Art	[700-(710, 720, 745.5, 790-(791.43, 792, 793.3))]	[94]
	Paranormal	130	[557]
	Religion	200	[98-99]
Free_Time		[790-(791.43, 792, 793.3)]	[578]
	Radio-Tv	[791.44, 791.45]	[88, 866]
	Play	[793.4:795-794.6]	[578]
	Sport	[794.6, 796:799]	[58]
Applied_Science		600	[.8]
	Agriculture	[338.1, 630]	[47]
	Food	[613.2, 613.3, 641, 642]	[48]
	Home	[640-(641, 642, 645)]	[49]
	Architecture	[645, 690, 710, 720]	[756, 946]
	Computer_Science	[004:006]	[83]
	Engineering	620	[73]
	Telecommunication	[383, 384]	[88]
	Medicine	[610-(611, 612, 613)]	[53-54]
Pure_Science		500	[2, 21-29]
	Astronomy	520	[31]
	Biology	[570-577, 611, 612-612.6]	[41-44]
	Animals	590	[44-45]
	Plants	580	[42-43]
	Environment	577	[49]
	Chemistry	540	[25-27]
	Earth	[550, 560, 910-(910.4, 910.202)]	[32-39]
	Mathematics	510	[12]
	Physics	530	[21-23]
Social_Science		[300.1:300.9]	[6]
	Anthropology	[301:307, 395, 398]	[511]
	Health	[613-(613.2, 613.3, 613.8, 613.9)]	[52]
	Military	[355:359]	[68]
	Pedagogy	370	[56]
	Publishing	70	[87]
	Sociology	[301:319-(305.8, 306.7), 360-(363.4, 368)]	[61]
	Artianship	[338.642, 745.5]	[795-797]
	Commerce	[381, 382]	[716]
	Industry	[338-(338.1, 338.642), 660, 670, 680]	[715]
	Transport	[385:389]	[78]
	Economy	[330-(334, 338), 368, 650]	[71]
	Administration	[351:354]	[63]
	Law	340	[66]
	Politics	320	[62]
	Tourism	[910.202, 910.4]	[799]
	Fashion	[390-(392.6, 395, 398), 687]	[761]
	Sexuality	[155.3, 176, 306.7, 363.4, 392.6, 612.6, 613.96]	[516]
	Factotum		not existing



# AGENDA

- Georg Eckert Institute (GEI)
- Digital Information and Research Infrastructures
- Integrating ICC in an LOD Environment
- **Conclusions**

# CONCLUSIONS

- Information Infrastructures
  - Edumeres
  - International TextbookCat
- Research Infrastructures
  - Meta Search
  - Faceted Browsing
  - Visualization
- LOD Environment
  - Challenges and Plans



Administration Services

Agresso

Pure



# CONCLUSIONS

productiv



OPSI



IT Services



Research Toolbox



**EDU|EXPERTS**

Expert Search

**SOLR**

Global Search

**Semantic Tools**

SemKoS

**DH Tools**

Welt der Kinder

GEI-Digital visualized

**Research Data Tools**

WorldViews

Semantic Data Repository (Linked Open Data)

GEI Repository (DSpace)

Research Data Repository (DSpace)

Administration Services

Agresso

Pure



# CONCLUSIONS

productiv

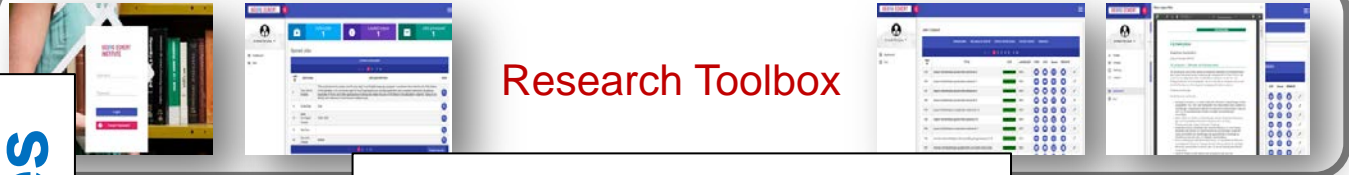


OPSI



IT Services

Digital Humanities



Research Toolbox

Information Retrieval

SOLR

Global Search

EDU|EX

Expert Search

Tools

SemKoS



DH Tools

Welt der Kinder



GEI-Digital visualized



Research Data Tools

WorldViews



Knowledge Organisation

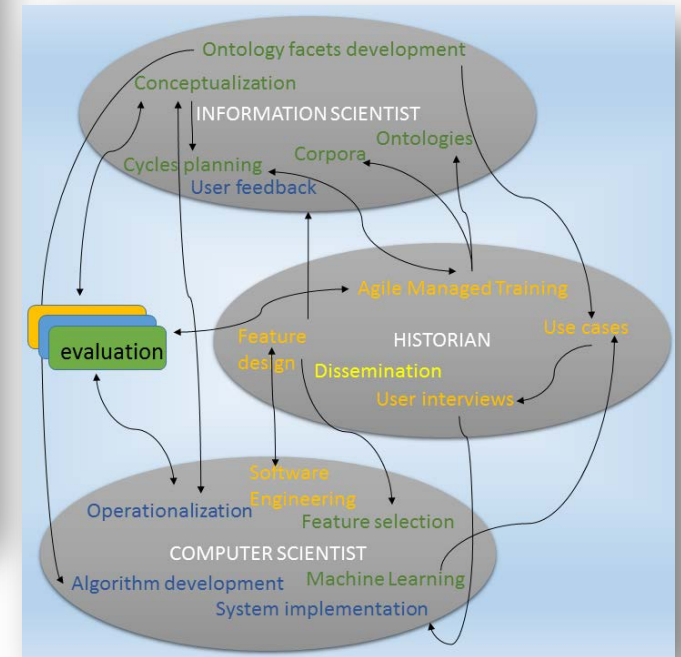
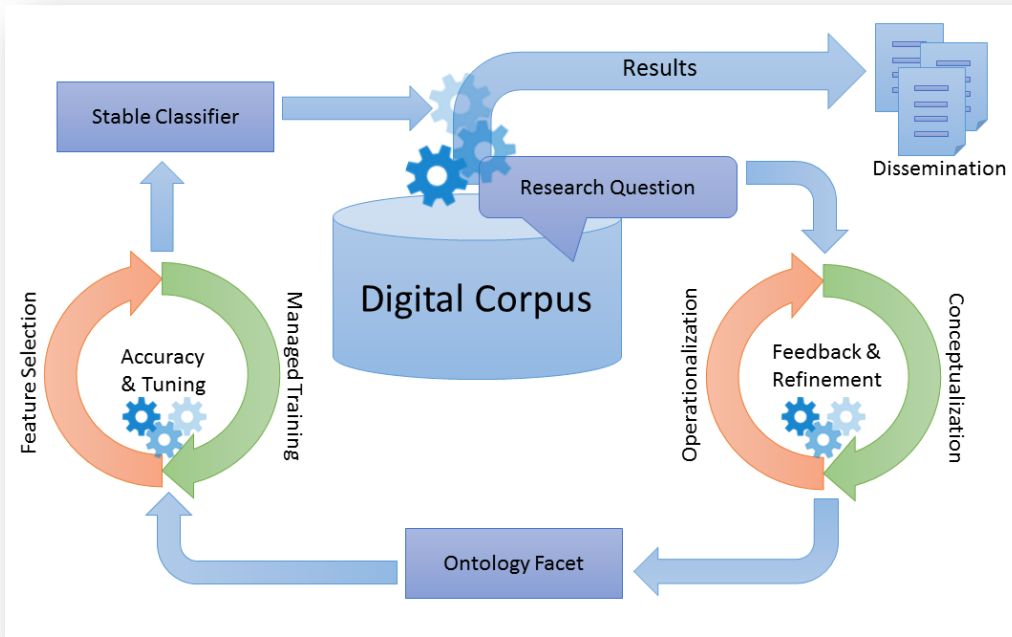
Semantic Data Repository (Linked Open Data)

GEI Repository (DSpace)

Research Data Repository (DSpace)

# CONCLUSIONS

## COMBINING KNOWLEDGE ORGANISATION WITH DIGITAL LIBRARIES



Communication, Methodologies and Digital Infrastructures are very important for interdisciplinary work with digital libraries

THANK YOU FOR  
YOUR ATTENTION!



QUESTIONS?

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