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Academic Social-Networking Sites (ASNS) for Research Communication: A Comparative Overview

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Academic Social-Networking Sites (ASNS) for Research Communication: A Comparative Overview

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Abstract: The primary purpose of research is to enhance the betterment of society by advancing knowledge through the development of scientific theories, concepts, ideas and new explorations, for attaining the purpose science can be communicated/disseminated in different ways. With the fast pacing age, advanced techniques and ideas for science communication and dissemination have emerged. Academic Social-Networking Sites (ASNS) for Research Communication is one of the major platforms for the scientific community for Academicians and Researchers to share their published and working research ideas. The paper discusses three well-known Academic Social-Networking Sites (i.e. ResearchGate, Google Scholar, and Academia.edu) for Research Communication through the exploratory inductive method.

Keywords: Academic Social-Networking Sites, Google Scholar, Academia.edu, ResearchGate, Research Communication, Research Dissemination, Research Archiving.

Introduction: The definitive Purpose of any Social Networking Site is to creating social connections and sustaining them by creating content and communicating within networks. The concept of academic social-networking sites is similar to social networking but the working of academic social networking sites is a bit different, that it's dedicated to research and academic intellectual and excellence through connecting research groups and their research yield in a better way. Important components of these academic social networks are to provide a platform to create a personal academic profile, establish connections with common academic interests, monitoring and managing academic and research outputs of self, and making use of research output of others in the list for advancement in particular fields. This paper is focused on identifying and accessing the abilities of well-known academic social networking sites to device with the basic needs of researchers and the academic arena.

Literature Review: Researchers have gone through some of the previous researches that are related to Academic Social-Networking Sites. Some of the excerpts are given as literature review for understanding background studies related to research topic.

(*Nature Medicine* 2011) Editorial of *Nature Medicine* published in February 2011 weigh up the thing about the academic social networks in brief communication that it was deliberate about widespread usability of academic social networks among academics and fostered

environment of sharing and collaboration of research using web 2.0 applications to providing opportunity to generate and curate content more seamlessly and dynamically than ever before.

(Ovadia 2014) studies two Academic social network in study- ResearchGate and Academia.edu: Academic Social Networks published by Behavioral & Social Sciences Librarian journal. Researcher discusses these networks as a multitude pupose basis, catering to those associated with academic institutions and specializing in academic activities like sharing papers and data sets. Researcher points about tendancy of acdemics that academics tend to be busy and social networking does not always seem to be the best use of a limited resource and concludes that the utility of these social networks will depend upon the individual basis.

(Ortega 2015) discusses ASNS in their research under title- Disciplinary differences in the use of academic social networking sites. Researcher detects and describes disciplinary differences in the users and use of several social networking sites by scientists. In conclusion researcher drawn a finding that Academia.edu is massively populated by humanists and social scientists, while RG is popular among biologists. Disciplinary differences are observed across every platform.

(Bhardwaj 2017) studied various academic social networking sites like ResearchGate, Academia.edu, Mendeley and Zotero in his study published in emerald based Information and Learning Sciences. Researcher discover various identical features like: General Features, Search & Browsing Features, Analytics and Altmetrics Features, Interactivity and Intelligence, Site Navigation, User Interface, Bibliographic Display, Output Features, Help Features and Provisions to upload contents by users in their study.

Method and Material: An exploratory inductive method was applied to review the platforms of Academic Social-Networking Sites by visiting websites and creating accounts on particular Academic Social-Networking Site. After hands-on using, identifying, and enlisting various available features of these Academic Social-Networking Sites inductive inferences were drawn for this attempt of comparative overview.

Academic Social-Networking Sites for Research Communication: The study beholds in 8 parts according to their varied core and important features as follows:

1. Basic Information
2. Common Important Features
3. Social Media and Collaboration
4. Document Types
5. Bibliographic Features and Services
6. Ontology Based Features
7. Metric and impact based features
8. Important additional features

In the end conclusive remarks are drawn on the inductive information basis.

Overview and Discussion:

1. Basic Information: This section depicts the basic information about Academic Social-Networking Sites. Researchgate and Academia.edu both was launched in year 2008, and Google Scholar was launched in year 2004. Owner of ResearchGate is Company named ResearchGate GmbH, Google Scholar is part of Google LLC and Academia.edu is owned by Richard Price. And Creators of ResearchGate are: Ijad Madisch, Sören Hofmayer and Horst Fickenscher, Google Scholar was created by Alex Verstak and Academia.edu was created by Richard Price. Headquarter of ResearchGate is Berlin, Germany. Google Scholar's headquarter is in city Mountain View of California and headquarter of Academia.edu is in San Francisco city of California. Information about coverage of Academic Social Networking Sites is as: ResearchGate have about 17 million of user population, Google scholar user population is not mentioned in their site, but research estimated size of documents was around 160-165 million in 2015 (Orduna-Malea, Ayllón, Martín-Martín, & Delgado López-Cózar, 2015). Nobody have mentioned about user population of Google Scholar further. And Academia.edu claims 71 million plus user population. Area served by all the Academic social-networking sites is worldwide but google servers are restricted in China due legal avenue, censorships and government policies in China (Lu et al., 2017). Coverage of all ASNS: Google Scholar, ResearchGate and Academia.edu is of multidisciplinary in nature. Google scholar is especially included in this study because it delivers the necessary communications to academia such a way like ASNS, as we know the purpose of particular academic social network is to disseminate the published research and data sets towards academic community of common interests.

Table No. 1 Basic Information:

Sr. No.	Information	Academic Social-Networking Site		
		ResearchGate	**Google Scholar**	**Academia.edu**
1	**Launched**	May 2008	November 2004	September 2008
2	**URL**	www.researchgate.net	scholar.google.com	academia.edu
3	**Owner**	ResearchGate GmbH	Google	Richard Price
4	**Creator/s**	Ijad Madisch, Sören Hofmayer, Horst Fickenscher	Alex Verstak	Richard Price
5	**HQ**	Berlin, Germany	Mountain View, California	San Francisco, California
6	**User Population (Approx.)**	17 million (May 2020)	Unknown	71 million
7	**Area Served/ Distribution**	Worldwide	Worldwide (Restricted in China only)	Worldwide
8	**Coverage**	Multidisciplinary	Multidisciplinary	Multidisciplinary

2. Common Important Features and services: The following table no. 2 describes the common important features and services of Academic social-networking sites. Important

significant features like content collaboration, online management of research records, Research documents library for further use, Search option and E-mail notification are common in all three Academic social networking sites. Advanced search option is available in ResearchGate only. And Notification management service is available in ResearchGate and Google Scholar. Google scholar have such a semantics developed that- it allows users to automatically add their new research to their profile.

Table No.2 Common Important Features:

Sr. No.	Features	Academic Social-Networking Site		
		ResearchGate	Google Scholar	Academia.edu
1	**Content Collaboration**	Yes	Yes	Yes
2	**Online Document Management**	Yes	Yes	Yes
3	**Library**	Yes	Yes	Yes
4	**Search**	Yes	Yes	Yes
5	**Advanced Search**	Yes	No	No
6	**Notification Management**	Yes	Yes	No
7	**E-mail notifications**	Yes	Yes	Yes

3. Social Media and Collaboration: In this section social media and collaboration feature of Academic social-networking sites are identified. The following table no. 3 shows that availability of personal profile, Co-author linking and Affiliation linkage are common social linking features in all three Academic social-networking sites. Research Network, Messaging and Social Media Linking options are available in ResearchGate and Academia.edu only. Personal Website option is available in Academic.edu but its subscription based service. File privacy management service is available in ResearchGate on proprietary basis.

Table No. 3 Social Media & Collaboration:

Sr. No.	Features	Academic Social-Networking Site		
		ResearchGate	Google Scholar	Academia.edu
1	**Personal Profile**	Yes	Yes	Yes
2	**Research Network**	Yes	No	Yes
3	**Co-author Linkage**	Yes	Yes	Yes
4	**Messaging**	Yes	No	Yes
5	**Personal Website**	No	No	Yes(subscribed feature)
6	**Social media links**	Yes	No	Yes

7	**Affiliation Linkage**	Yes	Yes	Yes
8	**File Privacy Management**	Yes	No	No

4. Document Types in Academic Social-Networking Sites: This section discusses about the available document types for uploading or archiving research communications in Academic social-networking sites. ResearchGate have availability of document types like: Article, Book, Chapter, Conference Paper, Negative result, Patent, Preprint, Technical report and thesis under Published research type. Google Scholar have various document types available for self-addition like: Article, Book, Chapter, Conference Paper, Patent, Court Case and Thesis. And Academia.edu can archive any document under common form in upload section. Some of other miscellaneous forms of documents like Presentations, Codes, Method, Poster and Raw data types are available in ResearchGate ASNS. Video form is supported by only Academia.edu.

Table No. 4 Document Types:

Sr. No.	Document Type	Academic Social-Networking Sites		
		Researchgate	**Google Scholar**	**Academia.edu**
1	**Published Research** 1. Article	Yes	Yes	Yes (All type of document under common form)
	2. Book	Yes	Yes	
	3. Chapter	Yes	Yes	
	4. Conference Paper	Yes	Yes	
	5. Negative Results	Yes	No	
	6. Patent	Yes	Yes	
	7. Court Case	No	Yes	
	8. Preprint	Yes	No	
	9. Technical Report	Yes	No	
	10. Thesis	Yes	Yes	
2	**Other Miscellaneous Types** 1. Presentation	Yes	No	Yes (All type of document under common form)
	2. Code	Yes	No	
	3. Method	Yes	No	
	4. Poster	Yes	No	
	5. Raw Data	Yes	No	
3	**Video Format**	No	No	Yes

5. Bibliographic Features and Services: This section discusses about bibliographic features and services of Academic social-networking sites. Citation Export services is available in ResearchGate and Google Scholar only. Export format like RIS, Bibtex and Plain text are

available in ResearchGate and Google supports to Bibtex, RefMan, CSV and EndNote formats for exporting the citations. Exporting citations with abstract is available in ResearchGate only. Standard citation styles like MLA, APA, Chicago, Harvard and Vancouver all are available in Google Scholar. ResearchGate allows citations in only APA. Adding and editing metadata of record is available all three Academic social-networking sites. Researchgate allows dedicated DOI generation service to non-published type of research works (i.e. methods, presentations).

Table No. 5 Bibliographic Features & Services:

Sr. No.	Feature	Academic Social-Networking Site		
		ResearchGate	**Google Scholar**	**Academia.edu**
1	**Citation Export**	Yes	Yes	No
2	**Export Format (Citation)**			
	1. RIS Format	Yes	No	NA
	2. Bibtex Format	Yes	Yes	NA
	3. Plaintext Format	Yes	No	NA
	4. RefMan Format	No	Yes	NA
	5. CSV Format	No	Yes	NA
	6. EndNote Format	No	Yes	NA
3	**Export Type (Citation)**			
	1. Citation Only	Yes	Yes	NA
	2. Citation with Abstract	Yes	No	NA
4	**Cite Styles**			NA
	1. MLA	No	Yes	
	2. APA	Yes	Yes	NA
	3. Chicago	No	Yes	NA
	4. Harvard	No	Yes	NA
	5. Vancouver	No	Yes	NA
6	**Add/Edit Metadata Manually**	Yes	Yes	Yes
7	**Dedicated DOI Generation**	Yes	No	No

6. Ontology Based Features: The following table no. 6 is about ontology based features of academic social-networking sites. Affiliation linking is available in all the three academic social-networking sites under study. Department and Members under dedicated departments' ontology is available in only ResearchGate. Research contributions under department and Member statistics is also linked in ResearchGate only. Research interest are indexed in both ResearchGate and Google Scholar only. Just one can click on term can find indexed relevant members under particular research interest.

Table No. 6 Ontology Based Features:

Sr. No.	Feature	Academic Social-Networking Site		
		ResearchGate	Google Scholar	Academia.edu
1	**Affiliation Linking**	Yes	Yes	Yes
2	**Departments**	Yes	No	No
3	**Members**	Yes	No	No
4	**Recent Contributions (Dept.)**	Yes	No	No
6	**Research Interest**	Yes	Yes	No
5	**Member Statistics**	Yes	No	No

7. Metrics and impact based features: In this section available metrics and impact based features are discussed. Citations count of research records and h-index indicator is available in ResearchGate and Google Scholar. i-10 index is available in Google Scholar. Impact Score i.e. RG Score is in ResearchGate which is counted through various exclusive parameters according to ResearchGate. ResearchGate provides department wide member statistics and percentile according to earned score points. Member Statistics is based on research document reads by other users and Percentile is calculated on the basis of RG Score compared with all the other registered users on platform.

Table No. 7 Metrics and impact based features

Sr. No.	Metric/Impact Feature	Academic Social-Networking Sites		
		Researchgate	Google Scholar	Academia.edu
1	Citations	Yes	Yes	No
2	h-index	Yes	Yes	No
3	i10-index	No	Yes	No
4	Impact Scores	Yes (RG Score)	No	No
5	Member Statistics	Yes	No	No
6	Percentile	Yes	No	No

8. Important Additional Features: This section covers additional features of the Academic social-networking sites. The following table no. 8 depicts some of the additional features available to these platforms like: Q-A Forums/ Discussions, Jobs/Careers, Trending topic links, Colleague Invitation, Language Support, Help Centre, Settings, Security and Privacy, etc. Q-A Forums and Jobs/Careers services are available in ResearchGate and Academia.edu. Trending topics (i.e. Covid-19 research) are linked in ResearchGate and Google Scholar. Colleague Invitation is available only in ResearchGate- through one can send a request to join to the platform through the mail. The features: Language Support, Help Centre, Settings, Security and Privacy all are available in all three ASNS platforms.

Table No. 8 Important Additional Features

Sr. No.	Feature	Academic Social-Networking Site		
		ResearchGate	Google Scholar	Academia.edu
1	**Q-A Forums/Discussions**	Yes	No	Yes
2	**Jobs/Careers**	Yes	No	Yes
3	**Trending Topic**	Yes	Yes	No
4	**Colleague Invitations**	Yes	No	No
5	**Language Support**	Yes	Yes	Yes
6	**Help Centre**	Yes	Yes	Yes
7	**Settings**	Yes	Yes	Yes
8	**Security & Privacy**	Yes	Yes	Yes

Concluding Remarks: After overview of features and functions of three academic social-networking sites following conclusive remarks are drawn.

Three Academic social networking sites (i.e. ResearchGate, Google Scholar, Academia.edu) under study shares many common important features like: Content Collaboration, Online Document Management, Document Library, Search Facilities, Notifications and their management, etc. at some or more extent but researchers observed that all are dedicated to primary purpose to disseminate research communications to academic community. When considering social media and collaboration Google Scholar seems on back foot as compared to both ResearchGate and Academia.edu. Because of there is no direct messaging options to communicate with other researcher, one can connect through e-mail on Google Scholar with verified users. Document types are most diverse types in ResearchGate, as compared to Google Scholar. Academia gives one common type to upload documents where video format is supported especially.

After reviewing Bibliographic features researchers found that Academia.edu doesn't supports such service. Using Google Scholar and ResearchGate one can export citations. Both platforms avails different reference management compatible formats through export feature. Google Scholar avails diverse citation styles like- MLA, APA, Chicago, Harvard and Vancouver. ResearchGate gives only one type of citation style. Researchgate have dedicated DOI generation feature which founds a spectacular facility for some type of documents.

Metrics and impacts based features available in Google Scholar and ResearchGate with citation counts, h-index in common. Academia.edu have Mentions feature similar like citations count. Some of proprietary features found like Impact Score (RG Score), Member Statistics and Percentile in ResearchGate. While considering important additional features- ResearchGate leads both Google Scholar and Academia.edu. Colleague Invitation founds best feature for promotion of academic research activity in user community.

After this overview we should point out that this study does not incorporate all the academic social-networking platforms used by research communities. This is because academicians usually uses most common and most known platforms for research communication. And

perhaps this depends upon user friendliness and flexibility of such platforms. In conclusion ResearchGate founds to best academic social networking sites due to diverse features and facilities, but it's weaker in few semantic features to capturing citations and research records automatically through web like Google Scholar and Acdemia.edu remains in third position due to unavailabity of important features like bibliographic and metrics based services.

Consequently, authors thinks that researchers can use multiple academic social networking sites among these for more research visibility and availability of published and working research.

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