

Information Literacy Competency Level of Social Science Researchers with Respect to Information Use Ethics : A Study

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ABSTRACT

Assessment of information literacy competency (ILC) is a process and method to find out whether a person possesses ILC and if so, to what level. The present study is an attempt to gauge the ILC level of social science researchers with respect to information use ethics. On the competency scale overall 79.62 per cent of the respondents, consisting maximum 16.54 per cent from economics followed by 15 per cent from political science, 13.08 per cent from history, 12.69 per cent from sociology, 11.35 per cent from law and 10.96 per cent from geography, were found competent in information literacy (IL) to use information ethically and legally. The rest 20.38 per cent of the respondents, consisting of maximum 4.42 per cent respondents from law 4.04 per cent from geography, 3.46 per cent from history, political science and sociology and minimum of 1.54 per cent from economics were found lacking competency in information literacy to use information ethically and legally. IL skills to deal with information abundance and manage information in the ICT age having multiple similarity detection software and stringent legal provisions are highly important. The study findings have clearly established that a good part of researchers are far behind competency level and possess only baseline or below IL skills on 'Information Use Ethics'. The findings are supposed to be of great help to all the stakeholders to plan, organise and participate in various information literacy activities and ultimately enhance the ILC of researchers on 'information use ethics'.

Keywords: ACRL standards; Citation; Competency scale; Information ethics; Plagiarism; Referencing

1. INTRODUCTION

The advances in technology and its implications on our lives profoundly impact us each day. The digitisation of human knowledge and its world wide networking is increasing at an exponential rate. The creation, transmission, reproduction of and access to all formats of information are now effortless and instantaneous. The advances in technology, particularly in information communication technology (ICT) have not only opened multiple information handling opportunities to humankind but have also posed serious ethical challenges. The threats of abuse and misuse of information have come along with all the benefits of a digitally connected world¹.

This new information environment has given rise to multiple issues of information handling and the most important among them is information ethics. The term "information ethics" was first used by Robert Hauptman to examine the issue of morality with reference to "information as a resource, a product, or as a target"². It has been defined as "the branch of ethics that focuses on the relationship between the creation, organisation, dissemination and use of information, and the ethical standards and moral codes governing human conduct in society"³. Basically, information ethics is concerned with information handling behaviors of individuals, groups and organisations. It is based on the ethical aspects of information process in society as a whole. In the new information environment, technological

advances have brought information ethics to the forefront. Information literacy (IL) has emerged as an essential concern to establish an ethical foundation to promote "fair, equitable and responsible information use" practices.

IL is a set of techniques, skills and capabilities essential for survival in the new information age. It encompasses a good understanding of all aspects of information in a specific discipline ranging from the awareness of various forms and formats of information, the underlying differences among them, expertise to locate and access various information formats and retrieve the required information, establish the reliability and validity of information, use the identified information ethically and communicate with rest of the world. IL is a skill, ability, expertise, capability and competency of a person that enables him/her to locate and retrieve relevant and authoritative information from multiple sources. Basically it is information about information and the source of information. In a nutshell, IL "is the competency that empowers one with the required knowledge about information, its nature and available formats; skills to fetch the relevant information by sifting the irrelevant, and attitude for consuming and sharing information, by ethical means and practices"⁴.

Periodic assessment of learners is critically important for success of any education and training program, as it provides continuous impetus for improvement and its success. It is equally applicable to information literacy. "Assessment is the means for learning, not just the method of evaluation. It is

designed to inform about the acquisition of skills and thought processes by the students”⁵. Of the multiple available standards and guidelines for assessing information literacy competency (ILC), Information literacy competency standards for higher education developed by Association of College & Research Libraries (ACRL)⁶ is considered to be comprehensive attempt and highly elaborate till date. Australia and New Zealand, leading IL advocates have developed their IL framework on the basis of it⁷. The ACRL Standards represent an all-inclusive attempt and offer a legitimate IL assessment framework. It includes a range of indicative “performance indicators” and “learning outcomes” and facilitates construction of useful and reliable assessment tools which can be used in multiple subject contexts. These standards were developed for instructors to adapt to local circumstances⁸. The students’ information needs in higher education at all levels and the outcomes for assessing student progress towards IL have been focus of these standards.

The present study is an attempt to assess the information literacy competency of social science researchers with respect to Standard V: the ethics and responsibility of information use. There are certain legal, logical, cultural and ethical responsibilities for using the information available in various forms and formats. Information use ethics consist of issues like unfair practice, fabrication, falsification and plagiarism; intellectual property rights, fair use, data protection and freedom of information. It could also encompass issues like code of practice and other ethical principles developed and accepted by the institutions and employees.

2. PURPOSE OF STUDY

The present study is an attempt to assess ILC level of social science researchers with respect to information use ethics.

3. RESEARCH HYPOTHESIS/QUESTION

There will be no significant difference in the ILC levels of researchers from different social science disciplines, e.g. Economics, Geography, etc, with respect to information use ethics.

4. SCOPE AND LIMITATION OF STUDY

The present study is part of a larger exercise aimed at assessing the ILC of social science researchers. It attempts to gauge the information literacy competency level of social science researchers only with respect to information use ethics. The information need of research scholars is quite unique and different from others. They need information on a continuous basis and are the biggest consumers of information. The study was conducted among the social science research scholars enrolled in PhD in the Department of History, Political Science, Economics, Sociology, Geography and Law at University of Delhi (DU), Jawaharlal Nehru University (JNU), Jamia Millia Islamia (JMI) and Indira Gandhi National Open University (IGNOU). The study is limited to the social science research scholars on roll during 2015-17 and selected concepts of ACRL Standard V.

5. LITERATURE REVIEW

Assessment of ILC is a process and method to find out whether a person possesses ILC and if so, to what level. In the rapidly changing new information environment periodic assessment of ILC has assumed greater importance. “Assessment can relate to teaching or to the level of information literacy of the student, or it can be directed to a set of standards and outcomes, to library instruction programs, etc”⁹. To assess information literacy competency, one should know what should be assessed, how it should be assessed, is there even a valid and feasible set of assessment tools, and so on¹⁰. There are a number of assessment methods like standard classroom tests based on multiple choices, fill-in-the blanks, and matching questions. Assessment can also be carried out in the form of pre-instruction and post-instruction testing. It can be a survey seeking students’ opinion to grade their own skills and competencies. Many a times it is in the form of ‘Online Tutorial’ having self testing module or it can be an instrument in which instruction is embedded. Rockman¹¹ has stated that a variety of quantitative and qualitative measures such as “portfolios, quizzes, tests, reflective essays, web-based tutorials, direct observations or service learning opportunities” can be used to assess IL performance of the students. However, Dunn¹² contends that such tests cannot assess the effectiveness of students’ search skills in real life situation.

Addressing the need of ILC assessment Kaufman¹³ opined that “although we live in an information age, most of the society suffers from information incompetency”. Hoffman and Goodwin¹⁴ also noted that even the students who are “technologically competent overestimate their ability to effectively search for and access information”. Assessment allows the library to get an actual picture of the information competency of its users and to identify areas which require improvement. Webber and Johnston¹⁵ suggested that ILC assessment should serve multiple purposes. It should be able to assess students’ current level of knowledge and skills; provide fruitful feedback during IL instructions for improvements and modifications; determine the levels of learning outcomes and overall success of the program.

Jarson¹⁶ enumerated the advantages of ILC assessment, by mentioning that an “effective assessment can help to understand students’ abilities and perceptions, measure the effectiveness of practices, develop criteria and standards, inform change, and more”. Pinto¹⁷, *et al.* made a subject area approach to the information literacy assessment in higher education (ILAHE). They identified five clusters involving the following issues: “evaluation-education, assessment, students’ efficacy, learning-research, and library”. Brown and Niles¹⁸ offered the most comprehensive review of the IL assessment research, compiling a critical bibliography of 90 research studies assessing information literacy published after 2007.

Oakleaf¹⁹ discussed the framework for assessing information literacy learning of students in the higher education system. Researcher further stated that this process is very open and the result has inspired librarians to engage new reflections and conversations in terms of information literacy instructions. The change will impact the librarians to update their approaches and instructions. Jacobson and Gibson²⁰

suggested five “curricular and instructional structures” as a “continuum of deepened engagement” with its core ideas of implementation of framework for information literacy for higher education by ACRL.

‘Information Ethics’ is a field of study that deals with ownership of and access to information. It “is concerned with ethical, legal and societal aspects of using information and communication technologies”²¹. It “provides a framework for critical reflection on the creation, control, and use of information”²¹. Ethical use of information means using information ethically. A comprehensive understanding of Information ethics helps us to understand the ethical use of information and properly quote, summarise, and paraphrase the information borrowed and cite the work of others to avoid research misconduct and plagiarism. Datig and Russell²² reviewed the literature and summarised the best practices on ethical use of information from a global perspective. The study serves as a guide for librarians to successfully incorporate ethical issues in IL programs and argues that librarians have a great responsibility to shoulder and promote academic integrity. Mannheim²³, *et al.* have explored the ethical dimensions of conducting research and proposes a library-specific ethical framework for conducting social networking service research. Jackson²⁴ has assessed undergraduate students’ understanding of plagiarism using an interactive, Web-based tutorial. Researcher has provided detailed instructional design process used to create the tutorial. The quiz scores of 2,829 students have been evaluated and analysed to measure student learning. The study has found that concept related to paraphrasing was difficult to understand and grasp. The web based survey study conducted by Boustany²⁵, *et al.* assesses the familiarity level of doctoral students with copyright issues. Results indicate significant lack of awareness on copyright and intellectual property right. The competency level of respondents on certain issues was even poorer.

Chen and Van Ullen²⁶ have reported the findings of workshops on research process and plagiarism conducted for international students at University of Albany. Research process focused on formulating search queries, locating and evaluating sources of information. Plagiarism focused on quoting, summarizing and paraphrasing the borrowed information, source acknowledgement, citation style and avoiding plagiarism. Learning assessment was made by administering pre and post tests. The findings indicate significant improvement in the learning of participants for both research process and plagiarism. Bratton and Strittmatter²⁷ have measured the ethical perceptions of 86 students on plagiarism scenarios. The study has used the multidimensional ethics scale, commonly used in business ethics research and found it “a reliable tool to measure changes in ethical perceptions of plagiarism”. The findings indicate that library instructions make fruitful impact on students’ perceptions on ‘information use ethics’. The study by Michalak²⁸, *et al.* has surveyed the understanding of faculty members, teaching graduate and undergraduate students on plagiarism during 2016 in a small college in US. It has found that majority of faculty members currently do not involve library professionals to provide instruction to students on academic integrity. The study concludes that library professionals should

collaborate with teaching faculty to develop new programs and activities on IL and academic integrity.

6. METHODS AND TOOLS

Assessment of ILC is a process and method to find out whether a person possesses information literacy competency and if so, to what level. The study has used questionnaire method to collect relevant data using information literacy competency standards for higher education, ACRL, 2000. The present paper deals only with ACRL Standard V, which reads as “The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally”. Some selected concepts of Standard V on ‘Information Use Ethics’, were transformed into a set of 10 questions to test the ILC level of the respondents. The concepts consisted of ‘referencing’, ‘in-text citing’, ‘citation style’, and ‘plagiarism’ including copying without acknowledgement, turning others work as own, paraphrasing without referencing and wrong punctuations. Various statistical tools like One-way ANOVA, F-ratio, and Post-Hoc test using LSD were applied for the analysis of the data. One-way ANOVA has been applied “to compare the means of more than two groups or levels of an independent variable ... The F-ratio is the ratio of between groups variance to within groups variance. A significant F-ratio indicates that the population means are probably not all equal”²⁹. Post-hoc Test helps the researchers to identify the differences between specific groups. In the present study post-hoc least significant difference (LSD) Test has been applied to explore all possible pair-wise comparisons of means comprising a factor using the equivalent of multiple t-tests. The following seven point performance and competency scale have been developed to measure the information literacy competency level of respondents.

In Table 1, ‘outstanding’ level denotes that ILC development is above the requirements, ‘excellent’ level denotes that ILC development clearly meets the requirements, ‘very good’ level denotes that ILC development meets the requirements, ‘good’ level denotes that ILC development meets the requirements but to a limited extent and ‘baseline’ level to ‘very low’ level denotes that ILC development is below the requirements.

Table 1. Seven point performance and competency scale

Percentage of marks	Grade	Performance grading	Competency level
91 and above	‘O’	Outstanding	Outstanding
81 to 90	‘E’	Excellent	Excellent
71 to 80	‘A’	Very good	Very good
61 to 70	‘B’	Good	Good
51 to 60	‘C’	Fair	Baseline
41 to 50	‘D’	Below average	Minimal
Below 40	‘F’	Failed/not responded	Very low

Table 2. Distribution of respondents by subject

University enrolled Respondents		Subject area of research						Total
		History	Political science	Economics	Sociology	Geography	Law	
DU	Number	20	20	20	20	20	22	122
	Per cent	16.40	16.40	16.40	16.40	16.40	18.00	100
JMI	Number	20	28	16	16	20	20	120
	Per cent	16.70	23.30	13.30	13.30	16.70	16.70	100
JNU	Number	22	24	22	24	24	26	142
	Per cent	15.50	16.90	15.50	16.90	16.90	18.30	100
IGNOU	Number	24	24	36	24	14	14	136
	Per cent	17.60	17.60	26.50	17.60	10.30	10.30	100
Total	Number	86	96	94	84	78	82	520
	Per cent	16.50	18.50	18.10	16.20	15.00	15.80	100

7. DISTRIBUTION OF RESPONDENTS

The details of respondents with respect to institution and subject area of research is presented in Table 2.

8. RESULTS AND DISCUSSIONS

The test performance scores out of 20 marks and grade for responses received from the respondents is presented in Table 3.

On the competency scale, overall, as many as 79.62 per cent of respondents consisting of 6.15 per cent ‘outstanding’, 28.46 per cent ‘excellent’, 26.92 per cent ‘very good’ and 18.08 per cent ‘good’ were found IL competent to use information ethically and legally. They were found competent in referencing and citation and were having good comprehension of multiple aspect of plagiarism. Subject wise the maximum 16.54 per cent of researchers form economics, followed by 15 per cent from political science, 13.08 per cent from history, 12.69 per cent from sociology, 11.35 per cent from law and 10.96 per cent from geography have exhibited competency in referencing and citation and were having good comprehension of plagiarisms. They have shown competency to properly quote, summarise and paraphrase information and idea from multiple sources and use it with proper citation. However, the maximum 4.42 per cent of researchers from geography, followed by 4.23 per cent from history, 3.27 per cent from political science, 3.08 per cent from law, 2.12 per cent from sociology and only 0.96 per cent researchers’ form economics were having only ‘good’ level of IL competency. They may operate in the digital information environment and ethically use information available from multiple sources and formats for a specific purpose. But they still require brushing up their IL skills and abilities on ‘information use ethics’. The detail of ILC level of respondents within subject is depicted in Table 3.

Adequate level of IL competency, particularly ILC related to information use ethics, is essential among researchers to successfully operate in the new information rich environment for good quality research and other academic activities. Overall, on the competency scale the rest of 20.38 per cent

respondents including 10.38 per cent ‘baseline’, 3.85 per cent ‘minimal’ and 6.15 per cent ‘very low’ did not possess the required IL skills and competency for information use ethics. This indicates that overall 20.38 per cent researchers have not learnt how to borrow and ethically use information available from different sources and in multiple formats. They are not capable to follow norms and maintain the academic integrity. Subject wise the maximum 4.42 per cent of researchers from law, followed by 4.04 per cent from geography, 3.46 per cent from history, political science and sociology and 1.54 per cent researchers from economics did not possess IL skills and competency related to ‘information use ethics’. The detail of IL incompetent researchers within subject is presented in Table 3. It is alarming to note that the highest IL incompetent researchers in information use ethics are from law.

A good number of researchers today are from the “millennial”³⁰ generation. They are habitual of effortless access to enormous amount of information³¹ preferably from Internet, using search engine like Google. They may have expertise in internet surfing but they lack IL skills³⁰ including critical thinking skills³². Many a times such researchers do not exactly understand what, where and how to locate, search and retrieve precise and relevant information required, evaluate and use information ethically from all the sources available to them³³. In the “contemporary environment of rapid technological change and proliferating information resources it is increasingly important that the users, particularly the researchers are equipped with advanced skills of information literacy”³⁴. The onus is on libraries and information centers “to empower the students, researchers and faculty members to seek, evaluate, use and create information effectively and efficiently to achieve their educational, social, occupational and personal goals”³⁵.

9. STATISTICAL SIGNIFICANCE

The overall mean score of responses received from the respondents for ‘information use ethics’ across all subjects is presented in Table 4 and Fig. 1. The responses reflect different

Table 3. Performance assessment of ILC for information use ethics

Subject Area of Research		Grade and Marks						Total	
		'F' 8 or Less	'D' 10	'C' 12	'B' 14	'A" 16	'E' 18		'O' 20
History	Count	6	8	4	22	22	22	2	86
	Per cent	6.98	9.30	4.65	25.58	25.58	25.58	2.33	100
Political Science	Count	4	2	12	17	31	24	6	96
	Per cent	4.17	2.08	12.50	17.71	32.29	25	6.25	100
Economics	Count	2	3	3	5	26	44	11	94
	Per cent	2.13	3.19	3.19	5.32	27.66	46.81	11.70	100
Sociology	Count	10	0	8	11	25	24	6	84
	Per cent	11.90	0	9.52	13.10	29.76	28.57	7.14	100
Geography	Count	2	0	19	23	21	10	3	78
	Per cent	2.56	0	24.36	29.49	26.92	12.82	3.85	100
Law	Count	8	7	8	16	15	24	4	82
	Per cent	9.76	8.54	9.76	19.51	18.29	29.27	4.88	100
Total	Count	32	20	54	94	140	148	32	520
	Per cent	6.15	3.85	10.38	18.08	26.92	28.46	6.15	100

mean scores for each social science subject covered under study. Economics has the highest mean score of 16.81, followed by political science with mean score of 15.35, sociology with mean score of 15.12, history with mean score of 14.74, law with mean score of 14.71, and geography with mean score of 14.49. The overall mean score of responses from respondents of all subjects under study is 15.25. It suggests that according to the ACRL's Standard V, research scholars from economics possess higher ILC skills followed by research scholars from political science, sociology, history, law, and geography at the four select central universities. The difference of mean score across all subjects has also been expressed in the mean plots (Figure 1). It also reveals that in terms of information use ethics the research scholars from Economics have shown the highest ILC followed by Political Science, Sociology, History, Law, and Geography research scholars.

10. TESTING OF HYPOTHESIS

There will be no significant difference in the ILC levels of researchers from different social science disciplines, e.g. Economics, Geography, etc, with respect to Information use ethics

One-way ANOVA was performed to examine difference

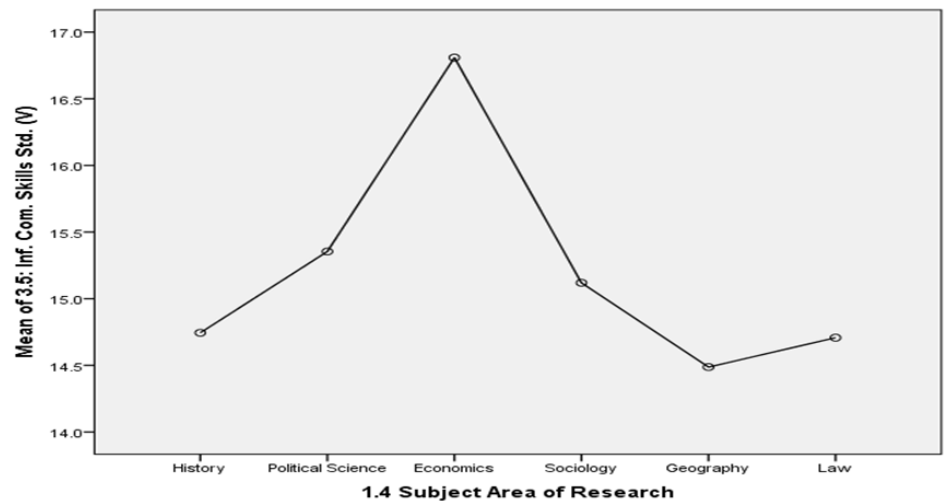


Figure 1. Mean plot of ILC for information use ethics.

between ILC level of social science researchers (ACRL's Standard V) across all the subjects. The results indicate there were significant differences.

$$F(5, 514) = 6.326, p = 0.000$$

11. POST HOC TESTS

Further, Post Hoc analysis using LSD was performed between the subjects. Table 6 shows that statistically there were no significant differences in ILC level of researchers across different subjects except between economics and history, economics and political science, economics and sociology, economics and geography, and economics and law.

Table 4. Descriptive statistics of ILC for information use ethics

	N	Mean	Std. Deviation	Std. Error	95 % Confidence interval for mean		Min.	Max.
					Lower bound	Upper bound		
history	86	14.74	3.218	.347	14.05	15.43	6	20
Political Science	96	15.35	3.050	.311	14.74	15.97	6	20
Economics	94	16.81	2.528	.261	16.29	17.33	8	20
Sociology	84	15.12	3.807	.415	14.29	15.95	2	20
Geography	78	14.49	3.010	.341	13.81	15.17	2	20
Law	82	14.71	3.477	.384	13.94	15.47	8	20
Total	520	15.25	3.273	.144	14.96	15.53	2	20

Table 5. ANOVA test of ILC for information use ethics

	Sum of squares	Df	Mean square	F	Sig.
Between groups	322.336	5	64.467	6.326	.000
Within groups	5238.156	514	10.191		
Total	5560.492	519			

To sum up, the mean score and post-hoc analysis of different subject areas for Standard V is statistically significant at 0.05 level. Hence, the hypothesis, "There will be no significant difference in the ILC levels of researchers from different social science disciplines, for e.g. Economics, Geography, etc, with respect to information use ethics" is rejected. Further there were significant differences between economics and history, economics and political science, economics and sociology, economics and geography, and economics and law.

12. CONCLUSION

Information literacy skills and competency associated with ACRL's standard V is quite essential to operate and manage information in the ICT age having multiple similarity detection software and stringent legal provisions. The performance assessment and resulting competency level suggest that performance of researchers in Economics is better and they possess higher level of ILC to use information ethically and legally followed by researchers from Political Science, History, Sociology, Law and Geography at the four select central universities. However, it is a great concern that as much as 20.38% of research scholars were found lacking in proper ILC to understand the economic, social and legal issues and use information ethically and legally. Prominent reasons identified for the same includes IL activities of universities under study are not based on models and standards; lack of

structured information literacy activity for the research scholars and IL content missing from the Ph.D. course work, particularly in social science departments.

For developing and improving upon the existing ILC level of the social science researchers the university libraries should start a combination of IL activities. University libraries should develop and maintain, with proper staff and other infrastructure facilities, a full time information literacy center/ cell/ unit. It is not necessary that each and every library professional may possess higher information literacy competency. Thus, imparting training and education to such professionals through 'Training the Trainer Program' at first hand is essential. As per UGC Guidelines (2009) Ph.D. course work is an essential part of research programs in the Indian universities. IL content should essentially be incorporated in the Ph.D. course work. A credit based and

curriculum integrated IL course is also suggested. Internet has facilitated a strong platform for online academic activities. Large number of teaching and learning tools and courses are available for various purposes. University libraries may fruitfully utilise this platform and provide 'Online Information Literacy Tutorials'. For successful implementation of any IL activity a close collaboration between the teaching faculty and the library professionals is essential.

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Table 6. Post hoc test of ILC for information use ethics

Subject area of research (I)	Subject area of research (J)	Mean difference (I-J)	Std. Error	Sig.	95 % Confidence interval	
					Lower bound	Upper bound
History	Political Science	-.610	.474	.199	-1.54	.32
	Economics	-2.064*	.476	.000	-3.00	-1.13
	Sociology	-.375	.490	.444	-1.34	.59
	Geography	.257	.499	.607	-.72	1.24
	Law	.037	.493	.940	-.93	1.00
	History	.610	.474	.199	-.32	1.54
Political Science	Economics	-1.454*	.463	.002	-2.36	-.54
	Sociology	.235	.477	.622	-.70	1.17
	Geography	.867	.487	.075	-.09	1.82
	Law	.647	.480	.178	-.30	1.59
	History	2.064*	.476	.000	1.13	3.00
Economics	Political Science	1.454*	.463	.002	.54	2.36
	Sociology	1.689*	.479	.000	.75	2.63
	Geography	2.321*	.489	.000	1.36	3.28
	Law	2.101*	.482	.000	1.15	3.05
	History	.375	.490	.444	-.59	1.34
	Political Science	-.235	.477	.622	-1.17	.70
Sociology	Economics	-1.689*	.479	.000	-2.63	-.75
	Geography	.632	.502	.209	-.35	1.62
	Law	.412	.496	.406	-.56	1.39
	History	-.257	.499	.607	-1.24	.72
	Political Science	-.867	.487	.075	-1.82	.09
Geography	Economics	-2.321*	.489	.000	-3.28	-1.36
	Sociology	-.632	.502	.209	-1.62	.35
	Law	-.220	.505	.663	-1.21	.77
	History	-.037	.493	.940	-1.00	.93
	Political Science	-.647	.480	.178	-1.59	.30
Law	Economics	-2.101*	.482	.000	-3.05	-1.15
	Sociology	-.412	.496	.406	-1.39	.56
	Geography	.220	.505	.663	-.77	1.21

*. The mean difference is significant at the 0.05 level.

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