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Table of Contents

Authors	pp.	Paper Title
Amiaya, Anita Oghenovo	1-11	Challenges and Strategies for Utilizing Information and Communication Technology Among Office Technology and Management Educators in Nigerian Polytechnics
Chen, Hsiu-Mei	12-22	Using Reciprocal Teaching to Enhance the Picture Book Comprehension of Preschool Children
Dillard-Books, Benita Myers, Nancy Stoll, Aimee	23-46	The California Reading and Literature Project: Helping Teachers Raise the Academic Language and Literacy Levels of California K-5 Student Population
Gheith, Asmaa	47-56	Problem-Based Learning as a TEFL Context in a Futuristic Democratic Society
Hsu, Ya-Huei	57-65	Analyzing Children's Drawings
Keeratipattarakarn, Kanitta	66-83	Geographic Information System for Flood Simulation in Nakhon Si Thammarat Province, Thailand
Kereszty, Orsolya	84-94	The Role of a Gender-Based History-Writing of Education in Preparation for Social and Civic Competence
Keskinturk, Timur Kuzu, Sultan Yildirim, Badahir F	95-103	A New Hybrid Meta-heuristic Approach for Stratified Sampling
Lentjushenkova, Oksana Lapina, Inge	104-116	Critical Analysis of the Concept of Intellectual Capital Investment
Li, Jen-Yi Krishnasamy, Malathy Chen, Der-Thanq	117-128	Where we are in the 21 st Century: Bringing out the voices of people with intellectual disabilities
Maloney, John	129-141	Introducing Creative Dramatics in Tertiary ESL Education
Skyring, Carol	142-152	Twitter as a Professional Learning Tool: Implications for Practice and Further Research
Elhourri, Wafaa Elkabani, Islam Hamandi, Lama	153-168	A Webometric Analysis of Some Universities in Lebanon



Challenges and Strategies for Utilizing Information and Communication Technology among Office Technology and Management Educators in Nigerian Polytechnics

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Abstract

The changes in work processes and business organizations as well as the model of transmission and exchange of information in the globalized economy call for transformation in the teaching and learning process in Office Technology and Management (OTM) to reflect the emphasis in the use of Information and Communication Technology (ICT). The major purpose of the study was, therefore, to assess the extent of utilization, challenges and strategies of ICT for repositioning OTM programme in Nigerian Polytechnics. Three research questions were generated and three null hypotheses were also formulated to guide the study. A survey design was adopted and the study was carried out in all Polytechnics offering OTM in South-South Nigeria. The population for the study comprised 85 OTM Educators. The entire population was studied hence no sampling techniques. A 45-item questionnaire was used for data collection. A reliability coefficient of 0.82 was obtained from Cronbach Alpha reliability test used. Seventy-eight (78) copies out of the eighty-five (85) copies of the questionnaire administered were collected and analysed. The research questions were answered using mean and standard deviation while the hypotheses were tested using t-test statistic at 0.05 level of significance. It was found that ICT was not effectively utilized in the institutions studied because of many challenges. However, many strategies for improving the utilization of ICT were identified. It was, therefore, recommended that government and the management of the institutions should endeavour to ameliorate the challenges with the identified strategies.

Keywords: Challenges, Strategies, ICT, OTM Educators

Introduction

Information and Communication Technology (ICT) can be seen as the bedrock for national survival and development of a country in a rapidly changing global environment. It challenges education planners and curriculum designers to address a host of vital socio-economic issues such as reliable infrastructure, skilled human resources, open government and other essential issues of capacity building. It is for this reason that every progressive country has to draw a national policy on ICT and the implementation of strategies to respond to the emerging global reality. A developing nation like Nigeria, which has aspired to participate effectively and become a key player in the emerging information age needs to have in place, a highly efficient information technology system driven by vibrant national Information Technology policy. This paper thus, deals with the challenges and strategies for effective utilization of ICT among Office Technology and Management (OTM) educators in Nigerian Polytechnics.

Office Technology and Management is a nomenclature that has replaced Secretarial Studies Programme in Nigerian Polytechnics as introduced by the National Board for Technical Education (NBTE) in 2004. This was as a result of an extensive review of Secretarial Studies Curriculum in order to make its recipients to be ICT-compliant and fit appropriately in the world of work, most especially, in modern offices that are characterized by various types of state of the art communication and technology. Polytechnic education in Nigeria is recognized as part of tertiary education whose aim is to provide middle-level manpower to man the various sectors of Nigerian economy (Ikelegbe and Odede, 2012). According to the National Policy on Education (FRN, 2004), Polytechnics in Nigeria shall maintain a two-tier programme of studies; namely, the National Diploma (ND) and the Higher National Diploma (HND) with one-year period of industrial experience serving as one of the pre-requisites for entry into the HND programme.

Office Technology and Management programme is designed to equip students with the competencies required to work in a modern office environment. The broad objectives of OTM programme, according to NBTE (2004), are:

1. Acquisition of Secretarial skills
2. Acquisition by ability to write shorthand for three minutes in varied materials at 1.3 syllabic intensity dictated at 80 Words Per Minute (WPM) and 1.4 syllabic intensity of 100 wpm and transcribe on the computer with a minimum of 95% accuracy for both ND and HND respectively.
3. Typing effectively various office jobs and acquiring a copying rate of 40wpm and 50wpm for ND and HND respectively on passages not below 1.3 syllabic intensity with 98% accuracy.
4. Acquisition of general education.
5. Laying the foundation for advanced studies.

The efforts towards the use of ICT in the training of office managers and its use in teaching office technologists/secretaries has met several challenges as pointed out by Udoeye and Ikenga (2010). These include:

1. Inadequate ICT infrastructure such as computer hardware and software
2. Resistance to change from traditional pedagogical methods of teaching secretarial education/office management to more innovative and technology-based teaching and learning method
3. Lack of skilled manpower to manage available systems
4. Inadequate facilities for office managers/educators at the tertiary institutions; and
5. Incessant electricity distribution.

Learning ICT skills is not sufficient, but using them to improve the teaching and learning environment is the key for pedagogy-technology integration. Understanding the changing role of teachers from instructors to facilitators, teacher-led instruction to learner-centered instruction is the key to the successful implementation of pedagogy-technology integration for teacher development. Therefore, preparing teachers to face the challenges of an ICT enriched teaching and learning environment is crucial. Nigerian teachers need to be equipped with the fundamentals of how to use ICT tools and to have a sufficient understanding of how the integration of these tools in the effective teaching-learning process can be smoothly facilitated. Effort must be oriented towards changing the teachers' mind-set by developing positive attitudes towards ICT applications in teaching and learning (Shyamal, 2005).

The changes occurring in businesses and industries with regard to the processes, production, distribution and marketing of goods and services together with the mode of information transmission and exchange require that the teaching and learning process of OTM should be effectively and efficiently reorganized to reflect the emphasis on the use of ICT in educational service delivery. Information and communication technology should be effectively utilized in OTM to match graduates with the current demands of modern organizations. An elaborate use of ICT in the implementation of OTM programmes will, in no small measure, assist Nigeria to achieve her Vision 20:2020. Vision 20:2020 is aimed at making Nigeria one of the 20 largest industrialized economies of the world by the year 2020.

According to Shyamal (2005), ICT include all the electronics means for gathering, processing, storing, sharing and distributing information, knowledge and ideas. Information and communication technology has integrated the world into a global village thereby making the processing, production, marketing and consumption of knowledge, skills, goods and services very easy without distance barriers. It encompasses all forms of information delivery systems that use multi-media, internet, intranet, extranet and interactive TV, among others. It is one of the major innovations that are taking place in Nigerian education system, particularly at the tertiary education level. The introduction of ICT in teaching and learning methods in Nigeria has affected the whole process of educational service delivery (Ede, 2009).

Effective utilization of ICT in OTM means that the teachers should be skilled in the use of ICT tools to improve their teaching methods. The teachers should be adequately trained and regularly retrained to acquire the competencies and skills required for effective utilization of ICT in instructional delivery. This can be evidenced in the students with the appropriate skills, knowledge and attitudes for employment in modern offices and organizations. Effective utilization can be possible with adequate provision of ICT facilities and infrastructure in OTM programme as well as adequate funding of the programme by government and all stakeholders in the education industry. According to Ejiofor (2009), the teachers as the implementers of curriculum, innovators and custodian of knowledge always require appropriate training, facilities, tools and motivation for effectiveness and technological advancement. Akinyemi (2001) attributed the poor quality of OTM graduates to many challenges which include poor teacher quality in ICT, inadequate ICT facilities and infrastructure, under-funding of OTM programme, lack of motivation and incentives to OTM educators. It is not yet certain that ICT is effectively utilized in the teaching and learning of OTM in Nigerian Polytechnics with widespread unemployment of the Polytechnic graduates and the myriad of challenges hindering the effective use of ICT in the institutions.

Purpose of the Study

The major purpose of the study was, therefore, to determine the effective utilization of ICT for repositioning OTM programmes in Nigerian Polytechnics for national development. Specifically, the study sought to:

1. Ascertain the extent of utilization of ICT in OTM programme in Polytechnics in South-South Nigeria,
2. Identify the challenges faced by OTM educators that hinder the effective utilization of ICT in OTM programme in Polytechnics in South-South Nigeria,
3. Identify strategies for enhancing the effectiveness of OTM educators for utilizing ICT in OTM programme in Polytechnics in South-South Nigeria.

Research Questions

The following research questions guided the study:

1. What is the extent of utilization of ICT in OTM programme in Polytechnics in South-South Nigeria?
2. What are the challenges faced by OTM educators that hinder the effective utilization of ICT in OTM programme in Polytechnics in South-South Nigeria?
3. What are the strategies for enhancing the effectiveness of OTM educators for utilizing ICT in OTM programme in Polytechnics in South-South Nigeria?

Hypotheses

Three null hypotheses were formulated to guide the study and tested at 0.05 level of significance:

1. There is no significant difference in the mean ratings of male and female OTM educators on the extent of utilization of ICT in OTM programme in Polytechnics in South-South Nigeria.
2. There is no significant difference in the mean ratings of male and female OTM educators on the challenges faced by OTM educators that hinder effective utilization of ICT in OTM programme in Polytechnics in South-South Nigeria.
3. There is no significant difference in the mean ratings of male and female OTM educators on the strategies for enhancing the effectiveness of OTM educators for utilizing ICT in OTM programme in Polytechnics in South-South Nigeria.

Methodology

A survey research design was adopted for this study to assess the opinions of OTM educators on the challenges and strategies for the effective utilization of ICT in OTM programme in Polytechnics in South-South Nigeria. The area of the study was the six South-South States of Nigeria namely: Delta, Edo, Bayelsa, Rivers, Cross River and Akwa-Ibom States. All the government-owned Polytechnics in the area that have established OTM department were used for the study. The population for the study was 85 OTM educators in the department of OTM in government-owned Polytechnics in the South-South States of Nigeria. The entire population was studied because it was manageable; hence, there was no sampling.

A structured questionnaire consisting of 45 items was used to elicit information from respondents on a five point Liker-type scale. The questionnaire was subjected to face validation by three experts: two from the OTM Department, Federal Polytechnic, Nekede,

Owerri, Imo State, Nigeria and one from the Department of Measurement and Evaluation, Delta State University, Abraka, Nigeria. In order to ascertain the reliability of the instrument for the study, it was trial-tested in three Polytechnics in South-East Nigeria. Thirty (30) copies of the instrument were administered to OTM educators in the Polytechnics. The result obtained after the trial-testing was subjected to the test of internal consistency using Cronbach Alpha procedure to measure its reliability before it was used for the study. The test yielded a coefficient of 0.82, indicating that the instrument was quite reliable for the study.

The instrument was administered to the Educators in their various institutions with the help of three research assistants. Eighty-five (85) copies of the instrument were distributed out of which seventy-eight (78) copies were returned and used for the study. The research questions were analyzed descriptively using mean and standard deviation based on a 5-point Likert-type scale. On the other hand, the null hypotheses were tested using t-test of difference between mean ratings of independent samples at an alpha level of 0.05.

Results

The results are presented according to the research questions and hypotheses that guided the study.

Research Question One

What is the extent of utilization of ICT in OTM in Polytechnics in South-South Nigeria?

Table 1: Mean Ratings of Male and Female OTM Educators on the Extent of Utilization of ICT in OTM Programme in South-South Nigerian Polytechnics

S/N	Items of ICT Utilization	Male			Female		
		X	SD	Dec.	X	SD	Dec.
1	Electronic presentation technology (PowerPoint)	3.58	0.87	MU	3.50	0.80	MU
2	Windows and file management technology	4.04	0.79	MU	3.89	0.86	MU
3	Computer networking technology	2.41	0.39	RU	2.38	0.56	RU
4	Internet and web browsing technology	2.66	0.67	SU	2.56	0.74	SU
5	Website design and navigation technology	2.85	0.62	SU	2.86	0.72	SU
6	Electronic spreadsheet technology	2.76	0.58	SU	2.86	0.72	SU
7	Software installation and downloading technology	2.79	0.78	SU	2.57	0.68	SU
8	Web communication technology	2.41	0.39	RU	2.47	0.98	RU
9	Computer-related devices (Discs, CDs, USB, among others)	4.22	0.36	MU	4.14	0.56	MU
10	Video conferencing technology	1.88	0.98	RU	1.56	1.07	RU
11	Scanning technology	3.89	0.89	MU	3.78	0.96	MU
12	e-mail and database management technology	3.58	0.69	MU	3.61	0.60	MU
13	Word and data processing technology	4.31	0.82	MU	4.41	0.70	MU
14	Computer security technology	2.74	0.55	SU	2.78	0.58	SU
15	Electronic learning technology (E-Learning)	2.45	0.82	RU	2.37	0.77	RU
	Average Mean and SD	3.11	0.68		3.05	0.75	

Key: X=Mean, SD=Standard Deviation, Dec=Decision, MU=Most-times Utilized, SU=Sometimes Utilized, RU=Rarely Utilized.

The data in Table 1 revealed that six items were most-times utilized with their mean responses ranging between 3.50 and 4.41. Four of the items had the mean responses ranging

between 1.56 and 2.47 which showed that they are rarely utilized while five items with responses ranging 2.56 and 2.86 shown in Table 1 were sometimes utilized in the teaching and learning of OTM. The overall average mean of 3.11 and 3.05 also indicated that all the ICT items were sometimes utilized. The overall average standard deviation, which is 0.68 and 0.75 also indicated that the respondents were close to one another in their opinions on the extent of utilizing ICT in OTM programme in South-South Polytechnics in Nigeria.

Research Question Two

What are the challenges faced by OTM educators that hinder the effective utilization of ICT in OTM programme in Polytechnics in South-South Nigeria?

Table 2: Mean Ratings of Male and Female OTM Educators on the Challenges Faced by OTM Educators that Hinder the Effective Utilization of ICT in OTM Programme in Polytechnics in South-South Nigeria

S/N	Items on challenges of ICT utilization	Male			Female		
		X	SD	Dec.	X	SD	Dec.
1	Inadequate ICT facilities and infrastructure	3.96	0.98	A	3.76	0.65	A
2	Lack of access to ICT resources	4.21	0.76	A	3.72	0.64	A
3	Shortage of ICT skilled Educators	4.14	0.84	A	3.92	0.65	A
4	Incessant electricity failure	4.56	0.88	SA	3.76	0.65	A
5	Lack of required competencies in the utilization of ICT resources	3.88	0.78	A	3.56	0.63	A
6	Lack of motivation and incentives for lecturers	4.31	0.94	A	4.04	0.86	A
7	Inadequate funding of OTM programme on ICT based curriculum	4.51	0.63	SA	4.10	0.98	A
8	Poor administration and supervision of OTM programme on ICT usage	3.88	0.78	A	3.89	0.62	A
9	High cost of acquisition and maintenance of ICT facilities	4.16	1.24	A	4.04	0.68	A
10	Poor perception and conservative attitude of lecturers on the use of ICT in instructional delivery	3.71	1.03	A	3.58	0.78	A
11	Inadequate time allocated for ICT-related instructions, training and practice	3.68	0.56	A	3.67	0.87	A
12	Inadequate technical support to keep ICT resources working during instruction	4.51	0.63	A	4.38	0.55	A
13	Frequent changes in the models of ICT resources	3.82	0.85	A	3.98	0.66	A
14	Haphazard integration of ICT into OTM curriculum	4.02	0.77	A	4.10	0.98	A
15	High cost of training and retraining of manpower	4.07	0.85	A	3.67	0.86	A
	Average Mean and SD	4.09	0.84		3.88	0.74	

Key: X=Mean, SD=Standard Deviation, Dec=Decision, A=Agree, SA=Strongly Agree

The data presented in Table 2 shows the respondents' level of agreement on the challenges hindering the effective utilization of ICT in OTM programme. All items in the table had their mean responses ranging from 3.56 to 4.56 which implied that the respondents agreed that the items were challenges faced by OTM educators that hinder the effective utilization of ICT in teaching and learning in OTM programme. All the items had an overall average mean of 4.09 and 3.88, which also implied that the respondents were in agreement about all items listed as challenges faced by OTM educators. The overall average standard deviation of 0.84 and 0.74

showed that all the respondents were close in their agreement that all the items listed were challenges that hinder effective utilization of ICT in OTM programme.

Research Question Three

What are the strategies for enhancing the effectiveness of OTM educators for utilizing ICT in OTM programme in Polytechnics in South-South Nigeria?

Table 3: Mean Rating of Male and Female OTM Educators on the Strategies for Enhancing the Effectiveness of OTM Educators for Utilizing ICT in OTM Programme in Polytechnics in South-South Nigeria

S/N	Items of Strategies for Enhancing ICT Utilization	Male			Female		
		X	SD	Dec.	X	SD	Dec.
1	Adequate provision of ICT facilities and infrastructure	3.79	0.89	A	3.58	0.86	A
2	Organization of ICT training and retraining programme for lecturers	4.46	0.58	A	4.16	0.51	A
3	Adequately subsidizing lecturers to own personal computers and laptops	3.65	1.07	A	3.60	1.09	A
4	Encouraging and supporting lecturers financially to participate in ICT-based professional development programmes	3.96	0.79	A	3.86	0.89	A
5	Periodic organization of ICT capacity-building programmes for lecturers	4.01	0.84	A	4.26	0.84	A
6	Periodic evaluation of lecturers on the extent of ICT utilization	4.12	0.66	A	3.98	0.67	A
7	Adequate funding of OTM programmes by government and private sector on ICT-based curriculum	4.36	0.82	A	4.21	0.81	A
8	Effective management and maintenance of ICT facilities	3.80	0.76	A	3.58	0.86	A
9	Making the acquisition and maintenance of ICT facilities tax free to reduce cost	4.14	0.82	A	3.98	0.78	A
10	Provision of automatic alternative source of electricity supply	3.94	0.70	A	3.98	0.78	A
11	Increasing the time allocated for ICT instructions, training and practice	4.16	0.98	A	4.10	0.88	A
12	Encouraging lecturers to search and share ideas and information on ICT with experts, colleagues and peers	3.88	0.59	A	3.68	0.79	A
13	Institutions partnering with professional and corporate bodies for adequate technical support	3.69	0.70	A	3.51	0.98	A
14	Periodic organisation of workshops, seminars and conferences on ICT for lecturers	4.21	0.75	A	4.01	0.84	A
15	Motivating the lecturers with adequate incentives	4.08	0.75	A	3.98	0.78	A
	Average Mean and SD	4.02	0.82		3.90	0.78	

Key: X=Mean, SD=Standard Deviation, Dec=Decision, A=Agree,

The data presented in Table 3 shows the respondents' level of agreement on the strategies for enhancing the effectiveness of OTM educators for utilizing ICT in OTM programme. All items in the table had their mean responses ranging from 3.51 to 4.46 which

implied that the respondents agreed that the items are strategies for enhancing the effectiveness of OTM educators for utilizing ICT in OTM programme. All the items had an overall average mean of 4.02 and 3.90 which also implied that the respondents were in agreement about all the items listed as strategies for enhancing the effectiveness of OTM educators for utilizing ICT in OTM programme. The overall average standard deviation of 0.82 and 0.78 showed that all the respondents were in their agreement that all the items listed were strategies for enhancing the effectiveness of OTM educators for utilizing ICT in OTM programme.

Table 4: Summary of t-test on the Extent of Utilization of ICT in OTM Programme in South-South Nigerian Polytechnics

Source	N	X	SD	DF	LS	t-cal	t-tab	Decision
Male	47	3.11	0.68	76	0.05	0.35	1.96	Not significant
Female	31	3.05	0.75					

Key: N=Number of respondents, X=Mean, SD=Standard Deviation, DF=Degree of Freedom, LS=Level of Significance

Table 4 reveals that the calculated t-value of 0.35 is less than the table value of 1.96 at 76 degree of freedom and at 0.05 level of significance. Since the table value is greater than the calculated value, the stated null hypothesis is accepted. This implies that there was no significant difference in the mean ratings between male and female OTM educators on the extent of utilization of ICT in OTM programme in South-South Nigerian Polytechnics.

Table 5: Summary of t-test on the Challenges Faced by OTM Educators that Hinder the Effective Utilization of ICT in OTM Programme in Polytechnics in South-South Nigeria

Source	N	X	SD	DF	LS	t-cal	t-tab	Decision
Male	47	4.09	0.84	76	0.05	1.05	1.96	Not significant
Female	31	3.88	0.74					

Table 5 reveals that the calculated t-value of 1.05 is less than the table value of 1.96 at 76 degree of freedom and at 0.05 level of significance. Since the table value is greater than the calculated value, it means that there was no significant difference whatsoever between the mean responses of the male and female OTM educators on the challenges faced by OTM educators that hinder the effective utilization of ICT in OTM programme in Polytechnics in South-South Nigeria. The stated null hypothesis for the independent samples and the entire items were, therefore, accepted.

Table 6: Summary of t-test on the Strategies for Enhancing the Effectiveness of OTM Educators for Utilizing ICT in OTM Programme in Polytechnics in South-South Nigeria

Source	N	X	SD	DF	LS	t-cal	t-tab	Decision
Male	47	4.02	0.82	76	0.05	0.71	1.96	Not significant
Female	31	3.90	0.82					

Table 6 indicates that the calculated t-value of 0.71 is less than the table value of 1.96 at 76 degree of freedom and at 0.05 level of significance. Since the table value is greater than the calculated value, it means that there was no significant difference between the mean responses of male and female OTM educators on the strategies for enhancing the effectiveness of OTM educators for utilizing ICT in OTM programme in Polytechnics in

South-South Nigeria. Therefore, the stated null hypothesis for the independent samples and the entire items were accepted.

Discussion of Findings

The result of this study indicated that most of the Information and Communication Technology tools studied were not extensively utilized. They were sometimes utilized in OTM programme in South-South Nigerian Polytechnics. However, electronic presentation technology (PowerPoint), windows and file management technology, computer-related devices (Discs, CDs and USB among others), scanning technology, e-mail and database management technology and word and data processing technology were utilized most times in the institutions. The in-extensive utilization of the ICT tools might be because of the non-availability of the ICT facilities, OTM educators' apathy on the use of ICT in their teachings as well as the incompetency of the lecturers. This is in line with Nwaokolo (2010) who stated that most educators do not utilize ICT in teaching and learning because they do not have the needed skills, and dearth of the facilities to use.

In line with Akinyemi (2001) who attributed the poor quality of OTM graduates to many challenges, the findings revealed myriad of challenges hindering the effective utilization of ICT in OTM in South-South Polytechnics in Nigeria which include inadequate ICT facilities and infrastructure, lack of access to ICT resources at will, shortage of ICT skilled lecturers, incessant electricity failure and inadequate funding of OTM programmes. Other challenges are inadequate technical support, lack of required competencies in the utilization of ICT resources, lack of motivation and incentives for lecturers, high cost of acquisition and maintenance, frequent changes in the model of ICT resources and poor perception and conservative attitude of lecturers in the use of ICT in instruction delivery. The result of the study also indicated that haphazard integration of ICT into OTM curriculum as well as high cost of training and retraining lecturers to match with the ICT integration is among the challenges hindering the effective utilization of ICT in OTM programme in the Polytechnics in South-South Nigeria.

Furthermore, the result of the study showed many strategies for enhancing ICT utilization in OTM programme in the Polytechnics. These include adequate provision of ICT facilities and infrastructure, organization of ICT training and retraining programmes for lecturers, adequately subsidizing lecturers to own personal computers and laptops, encouraging and supporting lecturers financially to participate in ICT-based professional development programmes, periodic evaluation of lecturers on the extent of ICT utilization and adequate funding of OTM programmes by government and private sector on ICT-based curriculum. Other strategies were effective management and maintenance of ICT facilities, making the acquisition and maintenance of ICT facilities tax free to reduce cost, provision of automatic alternative source of electricity supply and increasing the time allocated for ICT instructions, training and practice. Encouraging lecturers to search and share ideas and information on ICT with experts, colleagues and peers, institutions partnering with professional and corporate bodies for adequate technical support, periodic organisation of workshops, seminars and conferences on ICT for lecturers and motivating the lecturers with adequate incentives were also revealed by the result of this study as strategies for enhancing ICT utilization in OTM programme. This is in line with Rodriquez and Wilson (2000) who stated emphatically that professional development programmes help teachers to learn not only how to use new technologies but also how to provide meaningful instruction and activities with the technologies in the classroom.

Conclusion

Effective utilization of ICT in OTM programmes in Nigerian Polytechnics is vital in the national development of Nigeria, especially in the attainment of the nation's Vision 20:2020. Unfortunately, Polytechnics in South-South Nigeria do not extensively and effectively utilize ICT in the implementation of OTM programmes because of myriads of challenges. However, many strategies could be adopted to enhance the effective utilization.

Recommendations

Based on the findings, the following recommendations were made bearing in mind the need for implementation and effective utilization of ICT tools in OTM programme for national development.

1. Constant electricity supply should be provided to all ICT laboratories and if possible, alternative power supply should be provided to augment that of electricity providers in Nigeria.
2. Office Technology and Management educators should be given in-service training in the use of ICT to facilitate teaching and learning process.
3. Government and the management of the institutions together with good-spirited individuals and corporate organizations should endeavour to ameliorate the challenges with all the strategies identified by the study.
4. Office Technology and Management laboratories should be established to encourage practical appreciation of ICT in office procedures and tasks usually faced in Office Technology and Management
5. Adequate structure and technologies should be provided to achieve the goal of ICT-based curriculum in Office Technology and Management.

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Using Reciprocal Teaching to Enhance the Picture Book Comprehension of Preschool Children

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Abstract

The objective of this study is to understand changes in the picture book comprehension of preschool children after receiving reciprocal teaching in preschool picture book classes. A qualitative case study method was employed. The research participants comprised a preschool teacher and 15 Pre-K 4 and Pre-K 5 students. Data were collected through observations, interviews, and handouts, and subsequently analyzed. During a 4-month research period, a total of 32 in-class observations of picture book instruction sessions were conducted. The researchers interviewed the teacher and students regarding issues that the picture books discussed. The results revealed that the teaching scaffolding that the teacher established by implementing diverse interactive strategies enhanced the picture book comprehension of the children, who performed exceptionally well in perspective taking and understanding the causal relationships presented in the picture books.

Key Words: reciprocal teaching, picture book, picture book comprehension

Research Background and Objective

Model demonstration, observatory learning, and recognition drive the ability to think and social development of preschool children. In the recent decade, picture books have been widely applied in practical instruction. Picture books are literary works that combine images and text to convey educational, interesting, and artistic stories that promote learning and thinking in preschool children. The learning effectiveness of using picture books to educate preschool children substantially exceeds that of verbal lectures. Furthermore, picture books are considered a medium that involves substantial interaction (Yang, 2000). Previous studies have confirmed that picture books can increase learning effectiveness in preschool children (Chiu & Chan, 2009; Li, 2009). The cognitive development and life experience of preschool children are limited; therefore, adult intervention and guidance is critical for reinforcing the basic reading comprehension of children.

Hsiao (2013) proposed that implementing picture books in instructional strategies helps preschool children form abstract concepts and cultivates their value judgment and problem-solving abilities. Lan (2010) confirmed that employing scaffolding concept mapping in instructional strategies improves preschool children's concept of friendship and their performance in six knowledge structure dimensions. The results of previous studies have indicated that picture book instructional strategies can effectively increase the reading comprehension of preschool children.

Instructional strategies for picture book comprehension benefit children in numerous aspects, such as comprehending story structures and enhancing narrative ability and life experience. Interactive dialogues are a crucial component in picture book instructional strategies. Such dialogues contribute to the establishment of interactive relationships between teachers and students (Lin, 2006). For teachers, the interactive conversations are indicators of the preschool children's level of understanding of the story and their depth and scope of thinking. For preschool children, interactive dialogues provide a chance to think and collaborate with others, helping preschool children confirm, expand, and revise their understanding of the story content. Along with adult guidance, picture books can be used to cultivate language skills such as listening comprehension, question proposal, and expression, which are the basics for establishing a meaningful knowledge system.

Reciprocal teaching emphasizes the use of dialogue-based interaction between teachers and students in order to promote the reading comprehension strategies of learners. The strategies of predicting, questioning, summarizing, and clarifying are used in dialogues, which enables teachers and students to construct the meaning of texts collaboratively (Palincsar & Brown, 1984). Thus, the researchers of this study collected and compiled international and Taiwanese literature and determined that the reading comprehension of numerous underperforming preschool children improved significantly after reciprocal teaching was employed (Palincsar & Brown, 1984; Kelly, Moore, & Tuck, 1994; Aarnoutse, 1997; Bruce & Robinson, 2001; Lin, 2003; Chan, 2004). The aforementioned four reading comprehension strategies emphasized in reciprocal teaching was shown to increase both picture book comprehension and comprehension monitoring. These strategies are reading skills that can be applied by novices and are critical aspects that children with poor reading skills need to improve in. Reciprocal teaching, combined with the scaffolding method, can be used to help preschool children's independent use of picture books and enable preschool children and their teachers and peers to construct the meaning of text collaboratively by employing comprehension strategies in interactive dialogues.

In addition, relevant literature reports that the instructional strategies of reciprocal teaching are predominantly used for preschool children with learning disabilities or those who experience difficulty in reading comprehension. Reciprocal teaching was employed in the picture book

instructional strategies of the research subject, a teacher named Fang-Fang. This study determined whether reciprocal teaching improves preschool children's comprehension of picture books.

The objective of this study is to understand changes in the picture book comprehension of preschool children after receiving reciprocal teaching in picture book teaching.

Picture book comprehension refers to preschool children's understanding of the causal relationships and character perspectives in picture books; that is, perspective taking.

Theoretical Basis for Reciprocal Teaching

Zone of Proximal Development.

The zone of proximal development concept was proposed by Vygotsky and is defined as the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers.

Expert Scaffolding.

Expert scaffolding refers to the provision of supportive assistance from experts (e.g., teachers, peers, and parents) to children in text comprehension until children can solve problems independently. The purpose of scaffolding is to reduce the zone of proximal development of children gradually. The scaffolding strategy used in expert assistance is an adjustable medium that provides temporary support and can involve any type of teaching aid or strategy. Scaffolding is characterized by interactivity (Palincsar, 1986), and the support provided by scaffolding strategies can be adjusted according to the improvement of a child. When the ability of a child is improved and tasks can be completed autonomously or independently, teachers can gradually remove the scaffolding that supports the child in establishing new knowledge (Rosenshine & Meister, 1994).

Proleptic Teaching.

Proleptic teaching, which originated from Vygotsky's theory of child development, predicts the ability of preschool children. Learners are regarded as participants during instructional activities, and the teacher assumes the tasks of explanation and demonstration and provides a comprehensively supportive scenario. At the beginning of this instruction scenario, preschool children can complete simple aspects of a task; however, a high level of achievement is exhibited after the children gradually observe and learn expert behavior (Palincsar & Brown, 1984).

Reciprocal teaching is a method for enhancing reading comprehension that Palincsar and Brown (1984) proposed based on Vygotsky's zone of proximal development theory, expert scaffolding (Wood, Bruner, & Ross, 1976), and proleptic teaching (Rogoff & Gardner, 1984).

Content of Reciprocal Teaching

Reciprocal teaching involves learning groups comprised of teachers and preschool children. Teachers, children, and peers converse and take turns leading discussions to promote reading comprehension. Four reading strategies—questioning, summarizing, clarifying, and predicting—are used during discussions to elucidate the meaning of text with the objective of assisting preschool children in understanding and acquiring knowledge from the meaning of the text.

Reading Comprehension Strategies for Reciprocal Teaching

Picture book instructional strategies involve constant dialogues and interactions between the teacher and students who can collaboratively construct the meaning of text, enhancing the

students' comprehension of the picture book. Preschool children may require guidance and assistance from adults or peers to stimulate thoughts, which are then expressed verbally or through drawings. Palincsar (1984) contended that the four strategies in reciprocal teaching (i.e., questioning, summarizing, clarifying, and predicting) can increase children's comprehension of picture books (Hung, 2009). Therefore, the strategies proposed in reciprocal teaching are ideal for enhancing children's comprehension of picture books.

The four strategies of reciprocal teaching are described as follows:

Predicting

Predicting involves requiring preschool children to confirm clues and infer the upcoming content of text based on their prior knowledge and knowledge of the text (e.g., title, images, and descriptions in previous paragraphs). In other words, predicting refers to the process of children using their prerequisite knowledge and experience to predict possibilities in the picture book.

Clarifying

Clarifying refers to the problem-solving method that children use when the content of the reading material is ambiguous or unfamiliar. When teachers realize that children cannot understand the meaning of the picture book, the clarifying strategy is employed to assist children in understanding or resolving ambiguous concepts.

Summarizing

Summarizing refers to children identifying the key concepts of certain paragraphs or the entire text of the reading material and subsequently expressing these concepts in their own words. Repetitive and miscellaneous details and descriptions are discarded to emphasize the overall meaning of the text.

Questioning

Questioning involves requiring children to propose questions and answers related to the content and central concepts of the story, enabling children to self-reflect and determine whether they understand the key points of the story. In addition, questioning facilitates between-peer examination of the comprehension and memorization of the reading material. During picture book teaching sessions, teachers ask questions regarding the content that requires discussion, letting children attempt to combine prerequisite knowledge with contemplation and to examine the content of the picture book.

During picture book comprehension sessions, teachers should first understand the practical abilities and levels of preschool children and subsequently guide children toward learning and thinking by providing demonstrations, feedback, questioning, and understanding cognitive structures, enhancing the picture book comprehension abilities of children.

Research on Reciprocal Teaching

In recent years, reciprocal teaching has become a widely used instruction method in Taiwan. Numerous studies have indicated that reciprocal teaching is an effective method for enhancing the reading comprehension ability of general or underperforming students (Li & Lin, 2003; Ho & Lee, 2003; Lin 2005). The research analysis of several reciprocal teaching-related studies is presented as follows:

(a) In "Effects of Reciprocal Teaching on Reading Comprehension Improvements for Students at Resource Classroom of Elementary School" (Lin, 2005), the reading comprehension performance of students who participated in reciprocal teaching and their use of the four strategies

(i.e., predicting, questioning, summarizing, and clarifying) after the implementation of reciprocal teaching were examined. Based on the students' performance from using the four reciprocal strategies during the process of reciprocal teaching, reading comprehension was positively increased after reciprocal teaching was implemented.

(b) The objective of "The Effectiveness of Reciprocal Teaching on Students with Reading Comprehension Difficulties" (Ho & Li, 2003) was to elucidate the influence of reciprocal teaching on the reading comprehension abilities of students with reading comprehension difficulties. The primary findings indicated that reciprocal teaching was effective and retained the reading comprehension ability of students with reading comprehension difficulties.

(c) The objective of "The Research of Reciprocal Teaching on Improving the Reading Comprehension Abilities of the Students with Hearing Impairments" (Li & Lin, 2003) was to discuss the effectiveness of reciprocal teaching in enhancing the reading comprehension abilities of students with hearing impairments. The results suggested that reciprocal teaching enhanced the reading comprehension abilities of students with hearing impairments. Parents and teachers reported an enhancement in the reading comprehension abilities of the students after reciprocal teaching was employed, as did the participants (students) themselves.

The results of the aforementioned studies demonstrate that most studies support the notion that reciprocal teaching substantially improves reading comprehension abilities. However, most of the relevant studies have focused on students with learning disabilities or reading comprehension difficulties, and most of the participants were elementary or junior high school students. Few studies have examined the picture book comprehension of preschool children. Therefore, this study examined the changes in the picture book comprehension of preschool children after receiving reciprocal teaching during picture book sessions.

Methodology

A qualitative case study method was employed, and observations and semi-structured interviews were conducted to examine the discussion strategies adopted by the teacher during picture book sessions. As nonparticipants, the researchers observed and recorded interactions between the teacher and preschool children during picture book comprehension sessions to elucidate changes in the picture book comprehension of the children after reciprocal teaching was implemented. Interviews with the teacher and children were conducted to collect comprehensive data and compensate for insufficiencies during the observation process.

The research site was a private preschool known for excellent reading comprehension lessons. The research subject, Fang-Fang, was an experienced teacher who had been instructing preschool children for 14 years. Fang-Fang emphasized the importance of picture books and group discussion, which conformed to the requirements of this study. *I Am T-Rex* and *Why So Lucky Today* by Miyanishi Tatsuya were selected by Fang-Fang as picture book materials.

The body language and discussion content of the teacher and all of the children were video recorded. The transcription was coded to facilitate analysis. A sound recording device was used to record the interview with the teacher on the process of picture book instruction. Audio data from the video and sound recordings were then transcribed to acquire comprehensive and authentic data.

Research Findings and Discussion

Reciprocal teaching emphasizes the importance for children to ask questions actively during the process of picture book instruction and to learn and independently use the strategies of predicting, clarifying, questioning, and summarizing through scaffolding provided by the teacher.

This section presents and discusses the information collected from the observations, interviews, children's handouts, and research logs that were translated into textual data and then coded. The topics were connected and correlations were identified after the textual data underwent descriptive and cross-interpretation.

Teaching Scaffolding Based on Diverse Interaction Strategies to Enhance the Picture Book Comprehension of Children

The four strategies of predicting, clarifying, questioning, and summarizing are employed in reciprocal teaching. Teaching scaffolding is continually provided during reciprocal teaching and thus substantially enhances the picture book comprehension of children. When discussing the content of *Why So Lucky Today*, Fang-Fang identified a certain motivation and asked the children to think of ways to sooth the teacher's itchy throat. A student replied, "Scratching it will do." Fang-Fang then took a cough drop out of her pocket and expressed how lucky she was (observation 1-1_1020913). By demonstrating and scaffolding the concept of being lucky, the teacher enabled the children to observe the meaning of being lucky directly.

Discussing stories enabled the teacher and students to interact with ease. The teacher continued to use the reciprocal teaching strategies interchangeably to enhance the picture book comprehension of the children. "Why did Wulu feel lucky?" "What made him feel lucky?" (Student response: "Because he ran into a lot of piglets today"). "Yes, he feels lucky because he ran into a lot of piglets today, thank you! What else made Wulu feel lucky?" (Student response: "Curry mushroom soup"). "Curry mushroom soup. Do you think having curry mushroom soup made him feel lucky? How is that so?" (Student response: "It's yummy"). "It's yummy; the yummy curry mushroom soup made him feel lucky." (Observation 1-2_1020927).

The teacher used the strategies of questioning and clarifying to guide and encourage the children to think from different perspectives, and the logic and comprehension abilities of the children could be further understood based on their responses. "I might do more picture book reflections or propose metaphors based on experience. Yes, this is how I usually go about it. In the case of reflecting on, say, things that they find difficult to understand, I go back to review those paragraphs and explain them again." (Teacher interview-1_1020917). When the children did not completely understand the story content, the teacher repeated the story or recalled the content for clarification.

The teacher used the perspective-taking method to ask questions. "Would you save T-Rex if you were the little pterosaur?" (Observation 2-1_1021001). The children were encouraged to speak their minds and think from the perspective of the little pterosaur regarding whether to help T-Rex. Although this was a yes-or-no question, the reasons behind the children's answers were unique: "No, because he's mean." "Yes, because he's dying." (Observation 2-1_1021008). Perspective taking enabled the teacher to understand the children's level of understanding regarding the story content.

The teacher asked the children to predict the following content of the story based on clues and their existent knowledge. When children are required to employ the strategy of predicting, the answer should be logical rather than random guesses without basis. The teacher used the strategy of prediction to encourage the children to think of upcoming scenarios. Questions such as "so what's happening now?" and "what happens next?" (Observation 2-2_1021015) were used to guide the

children. Nevertheless, the children's guesses were based on imagination: "He will die" and "Then let him die." (Observation 2-2_1021011).

In picture book teaching sessions, the teacher repeated or summarized the children's words to help the children clarify their thoughts. During discussions, the teacher would repeat a child's words to the other children; for example, the teacher assisted in clarifying the statement of a child on stage: "Your grandmother cooked? You feel lucky because your grandmother cooked." The teacher then turned to the class and stated, "He said when he was hungry and wanted to eat, his grandmother cooked for him, so he feels lucky today." (Observation 1-3_1021112).

By using teaching scaffolding as support during the student-teacher interaction process of reciprocal teaching, the strategies of predicting, clarifying, questioning, and summarizing are employed. Subsequently, children gradually improve and adjust, thereby developing mature skills in using the strategies of reciprocal teaching and an enhanced picture book comprehension. Thus, based on the children's responses, teachers can determine what questions to ask. These questions provide children with appropriate scaffolding and enables children to learn how to think. By clarifying and repeating statements, teachers can help children further understand the meaning of picture books, enhancing the picture book comprehension of the children.

The Children Exhibited Excellent Performance in Perspective Taking and Comprehending the Causal Relationships of the Picture Books

The teacher held discussions to help the children understand the picture books. In this study, observations and interviews were conducted with the children and drawings on the children's handouts were examined to determine the picture book comprehension ability of the children.

The children could produce sentences expressing causality.

The picture book, *Why So Lucky Today*, was used to discuss the meaning of being lucky (student responses: "Because I got enough sleep," "I bought toys," and "I went out to play." Observation 1-1_1021108). A child was asked the following questions: "Were you lucky today?" (Student response: "I wanted a drawing book"). "Was it something you wanted really badly?" (Student response: "Yes, so my mom bought it for me"). "So how did you feel?" (Student response: "I felt lucky") (Observation 1-3_1021122). Based on this conversation, the children understood the causal context and could produce sentences with causality given the teacher's guidance. The following paragraph details the children's picture book comprehension situation based on observations and interviews conducted with the children.



Figure 4-1. Handout for *Why So Lucky Today* by Child B

The teacher asked: "Can you tell me what you drew in this picture?" (Student response: "I went out playing"). "Who did you go out with?" (Student response: "With my mother's coworker's

kid”). “What did the two of you do?” (Student response: “We played hide-and-seek”) (Child interview-1_1021119).

The teacher asked: “Can you tell me what you drew in this picture?” (Student response: “My mom took me out to play. I saw a shoe. I picked it up and threw...threw it all the way there, but because mommy said someone lost this shoe by accident, so we picked it back up and put it on the ground”). “So you helped someone?” (Student nodded.) (Child interview-2_1021213). When observing the children and examining their handouts, the researchers observed that in the preliminary discussions the children used brief sentences or simply described scenarios when answering the teacher’s questions. However, after additional discussions, the children clearly described the context and timeline of events. For example, the children stated their desire for something and what occurred afterward.

The children could contemplate their feelings and ideas from the perspectives of different characters.

When discussing the plot of *I’m T-Rex*, the children understood the perspectives and motives of the characters, and were able to express the characters’ feelings or their opinions with the teacher’s guidance. The children’s comprehension of the picture book content was examined through observations and interviews, and the results are presented as follows:

The teacher asked the following questions: “Would you save T-Rex if you were the little pterosaur?” (Student response: “No”). “Why?” (Student response: “Because he’s mean”). “Why won’t you save him because he’s mean?” (Student response: “I’m afraid he’ll eat me”). The teacher then said to the class, “He said he is afraid that T-Rex will eat him, so he would not save T-Rex” (observation 2-1_1021126). The teacher asked the following question: “If you were T-Rex, would you eat the little pterosaur?” (Student response: “Yes”). The teacher then said to the class, “She said yes. Let’s see why,” and addressed the student who answered the question: “But the little pterosaurs just saved you, why would you eat it?” (Student response: “Because I’m hungry”) (Observation 2-2_1021213).

The teacher asked the children questions based on incidents involving the main characters in the story. For example, the teacher asked, “If you were T-Rex, would you eat the little pterosaur?” and “Why won’t you save him because he’s mean?” The teacher asked questions involving the two main characters to enable the children to think from the perspectives of these characters and express their own feelings (e.g., “I’m afraid he’ll eat me,” “because he’s dying,” and “because I’m hungry”).

After three repeated discussions, the children could satisfactorily contemplate incidents that occurred in the story. The researchers and teacher observed that the children’s answers differed in each discussion, indicating that repeated discussions stimulated the children’s thoughts, as explained in the following quote:

“This activity shows that the children do not provide consistent answers. For instance, they might provide a positive answer when first asked the question, but when the same question is asked a third time, their answer may be negative; they alter their thoughts. I think repeatedly using the same picture book is good. When the children answer a question for the first time, they may not even realize it themselves, but when they answer a question for the first time, they might say ‘Yes, I will help him,’ but if asked the same question a second time, they may change their minds and say ‘I don’t think I can help him because he might eat me.’ If asked the same question a third time, they might decide that helping him will not cause any harm, because he didn’t eat the pterosaur.” (Teacher interview-2_1021206).

Based on the aforementioned theories and practical applications, reciprocal teaching is an ideal instructional strategy for enhancing the picture book comprehension of preschool children.

The importance of scaffolding provided by the teacher is revealed in reciprocal teaching. By interacting with preschool children, teachers provide appropriate guidance and scaffolding for children to become familiar with using certain strategies gradually; thus, guiding techniques are essential for teachers. Based on long-term observations, we determined that a teacher's instruction habits and level of recognition for picture book comprehension instruction affect the quality of picture book comprehension strategies that are instructed. Therefore, we recommend enhancing the curriculum design for picture book instruction and establishing systematic professional training for teachers, including demonstration strategies, conversation guiding, assessment strategies, and teachers' self-reflection strategies. By implementing these measures, teachers will be able to determine whether instructional activities comply with the content of reciprocal teaching.

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The California Reading and Literature Project: Helping Teachers Raise the Academic Language and Literacy Levels of California's K-5 Student Population

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Abstract

The purpose of this study was to determine the effect of the California Reading and Literature Project (CRLP-Region 8) Signature Program, RESULTS: Academic Language and Literacy Instruction K-6 (RALLI), on students' comprehension of increasingly complex informational texts and on teacher efficacy. The theoretical framework underpinning this research was Shefelbine's (2007) proposed literacy framework for assessment and instruction. This study utilized mixed methods combining qualitative analysis to highlight teachers' perceptions about RALLI training and quantitative methods to measure students' pre- and post-assessment comprehension of informational texts after teachers implemented RALLI strategies. Qualitative data concerned the participants' confidence in teaching comprehension of complex informational texts. Quantitative methods were used to determine the impact that teachers trained through RALLI had on students' comprehension. Upon completion of the program, the researchers found the implementation of RALLI strategies improved students' comprehension of complex informational texts and participating in RALLI positively influenced teacher efficacy.

Key Words: CRLP, RALLI, TEXT & TASK ANALYSIS TEMPLATE (TTAT), Backward Design Process.

Introduction

Research on teaching children to comprehend informational texts in the elementary classroom setting has increased significantly in recent years, stimulated, in part, by the 2013 National Assessment of Educational Progress (NAEP) Framework calling for 50% informational passages by fourth grade, 55% by eighth grade, and 70% by twelfth grade (National Assessment Governing Board, 2013). Previous research in the field of childhood education suggests that early exposure to informational texts is imperative. Calo (2011), for example, found that early exposure to informational texts gave younger students an opportunity to learn about the world around them; while, Hall and Sabey (2007) reported that effective use of informational texts taught elementary students how to navigate through the difficulties associated with informational material. Difficulties associated with informational texts included vocabulary, text structure, and unique text features (Zhihui, 2008; Hall & Sabey, 2007). Because most students will face challenges when encountering informational texts, Cummins and Stallmeyer-Gerard (2011) called for well-defined explicit instruction due to the cognitive demands of informational material. Yopp and Yopp (2012) concluded that exposure to informational texts in the early years is necessary if students want to succeed in a world that required an ability to navigate genres that “dominated the later years of schooling and adulthood” (p. 481). It has become evident that informational texts are here to stay.

In response to the academic literacy requirements for the 21st century, the California Reading and Literature Project in Region 8 (CRLP-Region 8) offered an institute featuring a signature professional development program, RESULTS: Academic Language and Literacy Instruction K-6 (RALLI) to elementary school teachers in Ventura, Santa Barbara, San Luis Obispo, and Kern Counties. RALLI is designed to provide teachers with the tools and skills necessary to analyze the academic language and literacy demands of complex informational texts and materials. RALLI supports teachers in designing effective instruction to help their students make meaning from complex grade-level text, whether read aloud to students or read by students with instructional support, and to use evidence from the text to demonstrate their comprehension. The intended outcome of the RALLI institute was to increase the capacity of participants to implement instructional strategies and routines to help make complex informational texts more accessible to all students, to increase students’ use of academic language, and to improve motivation and engagement.

Background

In a previous study, we examined the impact of CRLP-Region 8’s institute, *Reframing Teacher Leadership: Action Research Study Group*, on K-12 teachers’ attitudes and perceptions. This study is available for review (Myers & Dillard, 2013). However, a brief discussion is provided to contextualize the current study. In 2010, CRLP-Region 8 began a two-year longitudinal study to examine the impact that participating in an action research project had on 24 teachers’ leadership attitudes and perceptions about working in a collaborative environment. The theoretical foundation underpinning this study was Reeves’ (2008) *New Framework for Teacher Leadership*. Mixed-methods were used to analyze participants’ feedback through surveys and field notes. In the first year of the study, participants indicated that the CRLP-Region 8 Action Research Group helped them “to identify and apply classroom practices and changes in student learning” and “skills to use when working with teachers.” Of the 10 participants who provided responses to the 2010-11 Reframing Teacher Leadership Response Summary, all expressed that RALLI training improved their confidence in teaching complex informational texts (see Appendix A) and they expressed an interest in participating in the second year of the study.

Twenty-four teachers enrolled in the 2011-12 Action Research Group, including the ten participants from the previous year. Each participant was required to complete a pre-survey. The pre-survey results revealed that about half the participants had little or no direct exposure to action research. Of the 24 participants in the Action Research Group, 54% reported that they had never collaborated with other educators to develop and implement action research in their classroom or school while 45% said they had collaborated with others on action research projects.

Participation in the RALLI Action Research Group appeared to positively affect teacher pedagogy. According to the post-assessment, 54% percent of the participants developed a positive perspective on action research. Several participants described in some detail the beneficial impact that working with others collaboratively had on their pedagogy. After participating in the study, teachers found themselves feeling empowered to improve their pedagogy and student achievement.

The results confirmed the claim made by educational researchers that action research empowers teachers by increasing their sense of having a greater stake in curriculum and instructional decisions. Action research also appears to provide them with a framework to continuously improve their pedagogical practices. And while much has been written about action research and its impact on teachers' perspectives, more research is necessary to determine what affect it had on student achievement and, in particular, student comprehension of informative texts. Thus, our primary intent in conducting this study is to determine the impact of using an action research methodology to implement CRLP's signature RALLI program on students' comprehension of complex informational text and how the implementation of RALLI influenced teacher efficacy.

Theoretical Framework

CRLP-Region 8 used Shefelbine's (2007) proposed literacy framework for assessment and instruction. The five major components of this framework are essential to developing literacy and academic English language proficiency and are the foundation for all of CRLP's signature programs. This framework is the basis for effectively differentiating language and literacy instruction in any content area, which will ultimately help students meet the demands of reading complex text. These five areas of the literacy framework are

- Motivation,
- Word recognition and spelling strategies,
- The automaticity component of fluency,
- Academic language, which includes background or topic knowledge and vocabulary knowledge, and
- Comprehension strategies, which include syntax (grammar), text structure, comprehension monitoring, and reorganizing text.

Students' overall reading ability is a composite of all five of these components working together. In other words, when students fail to comprehend literature, textbooks, and related reading materials, such as primary sources, the actual cause of their difficulties can be any one or combination of these components. By considering these five components, teachers are better able to diagnose areas of weakness and plan lessons to effectively differentiate classroom instruction.

Method

Research Design

This study utilized mixed methods combining qualitative analysis to highlight teachers' perceptions of how RALLI improved their confidence in teaching comprehension of complex informational texts with quantitative methods to determine the effect of RALLI on students' comprehension of informational texts. According to Creswell (2009), a mixed methods research design is a procedure for collecting, analyzing, and "mixing" both quantitative and qualitative research and methods in a single study to understand a research problem. Creswell (2005) considered a mixed methods design as exploratory and appropriate when a researcher wanted "to explore a phenomenon in-depth and then measure its prevalence" (p.75). This design required the researchers to explore the research topic first from a qualitative stance; the qualitative findings then guided "the development of items and scales for a quantitative survey instrument" (p.77). This study focused on students' pre-assessment and post-assessment results from K-5 classrooms.

Participants

The study participants were five kindergarten teachers, six 1st grade teachers, nine 2nd grade teachers, eleven 3rd grade teachers, one 4th grade teacher, four 5th grade teachers, six 2nd grade teachers, and one 4th/5th grade teacher. There were 43 participants.

Procedures

The study began in January 2013 and concluded six months later. The participants administered a pre-assessment to their students before they began using informational texts from the *Common Core State Standards, Appendix B: Text Exemplars and Sample Performance Tasks*. Since some of the actual texts noted in the *Common Core State Standards, Appendix B: Text Exemplars and Sample Performance Tasks* were not accessible, texts written by authors referenced were used instead. For the pre-assessment, the participants were instructed to conduct a "cold" read in which they did not provide background information, vocabulary instruction, or comprehension monitoring during the reading. The students were not given any instruction to access the text. Kindergarten through second grade teacher participants were asked to read the text orally to their students, while third through fifth grade teacher participants had students read the text independently.

After the reading, the students were required to analyze the passage by determining the main idea and at least three details that supported the main idea in a brief paragraph. This expressive task demonstrated their comprehension of the text. Kindergarten and first grade students had the opportunity to draw or tell the main idea and supporting details to their teacher. The teacher participants then scored the expressive task using the Smarter Balanced Informative Writing Rubric as shown in Figure 1.

Smarter Balanced Informative-Explanatory Writing Rubric (Grades K-5)

Score	Statement of Purpose/Focus	Elaboration of Evidence
4	The response is fully sustained and consistently and purposefully focused: <ul style="list-style-type: none"> Controlling idea or main idea of a topic is focused, clearly stated, and strongly maintained Controlling idea or main idea of a topic is introduced and communicated clearly within the context 	The response provides thorough and convincing support/evidence for the controlling idea or main idea that includes the effective use of sources, facts, and details: <ul style="list-style-type: none"> Use of evidence from sources is smoothly integrated, comprehensive, and relevant Effective use of a variety of elaborative techniques
3	The response is adequately sustained and generally focused: <ul style="list-style-type: none"> Focus is clear and for the most part maintained, though some loosely related material may be present Some context for the controlling idea or main idea of the topic is adequate 	The response provides adequate support/evidence for the controlling idea or main idea that includes the use of sources, facts, and details: <ul style="list-style-type: none"> Some evidence from sources is integrated, though citations may be general or imprecise Adequate use of some elaborative techniques
2	The response is somewhat sustained and may have a minor drift in focus: <ul style="list-style-type: none"> May be clearly focused on the controlling or main idea, but is insufficiently sustained Controlling idea or main idea may be unclear and somewhat unfocused 	The response provides uneven, cursory support/evidence for the controlling idea or main idea that includes partial or uneven use of sources, facts, and details: <ul style="list-style-type: none"> Evidence from sources is weakly integrated, and citations, if present, are uneven
1	The response may be related to the topic but may provide little or no focus: <ul style="list-style-type: none"> May be very brief May have a major drift Focus may be confusing or ambiguous 	The response provides minimal support/evidence for the controlling idea or main idea that includes little or no use of sources, facts, and details: <ul style="list-style-type: none"> Use of evidence from the source material is minimal, absent, in error, or irrelevant
0	A response gets no credit if it provides no evidence of the ability to state the main idea and provide supporting details.	

Figure 1: Smarter Balanced Informative Writing Rubric. *Note.* The Smarter Balanced Informative Writing Rubric is from the Smarter Balanced Assessment Consortium (2013)

RESULTS: Academic Language and Literacy Instruction K-6
Supporting Implementation of the Common Core State Standards

1.4 – RESULTS Lesson Planning Steps for the Core Routines

Before Reading	
1.	The Background Overview: Assessing Background Knowledge (Think-Pair-Share or Think-Write-Pair-Share)
2a.	The Background Overview: Building Background Knowledge (HGO) Create Hypothetical Graphic Organizer on separate piece of paper
2b.	Describe the logical sequence you will use to construct the HGO with your students
3.	Write the receptive task on the board and read to class
4.	Write the expressive task on the board and read to class
5.	Point out the text structures and features
During Reading	
6a.	Setting and Monitoring the Purpose for Reading
6b.	Self-Checking for Understanding
6c.	Employing Fix-Up Strategies
7.	Vocabulary “Step Asides”
8.	Levels of Organization- Story Grammar and/or Outlining
After Reading	
9.	Structured Language Practice with Functional Language Patterns
10.	Graphic Organizer for the Expressive Task
11.	Content Conversation Linked to the Expressive Task
12.	Provide Feedback to Students

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TAB 1: Introduction, Rationale, and Outcomes

11

Figure 2: RESULTS Lesson Planning Steps for the Core Routines. Note. From *Results: Academic Language and Literacy Instruction K-6 Teacher's Handbook* (p. 11) by M. Adams and J. Shefelbine. Copyright 2011 by California Reading and Literature Project, University of California. Reprinted with permission.

For the post-assessment, all students were provided direct instruction with the RALLI core instructional routines (see Figure 2) using RALLI strategies that helped teachers analyze the academic text their students will read or that will be read to them.

Participants used the Text & Task Analysis Template (TTAT), an important component of the Backward Design Process (Wiggins & McTighe, 1998) for lesson planning (see Figure 3). By employing the TTAT, teachers were alerted to qualitative factors that could contribute to text complexity and appropriateness as they planned their instruction. They learned how to conduct text analysis with an organizing principle that represented the foundational knowledge students had to have in order to meet both receptive and expressive tasks related to the reading. The TTAT supported teachers in establishing: (a) expressive task(s) for their students to demonstrate their comprehension of the reading; (b) the language that students were required to produce to carry out the expressive task(s); and (c) what vocabulary to teach before, during, and after reading.

RESULTS: Academic Language and Literacy Instruction K-6
Supporting Implementation of the Common Core State Standards

4.2 – Lesson Text & Task Analysis Template

Text and Task Analysis Template Integrated Content and Language Focus					
Text Title:		Standard(s)		Reading Assignment – Pages or Passages:	
Organizing Principle (Content Objective) What is the “must know” of this selection of text and/or material? What is the big or main idea of the selection and the enabling knowledge - important ideas, details, and/or examples?					
Receptive Task How will I explain the purpose(s) for reading to help students think about (and meet) the organizing principle?					
Expressive Task How will I explain what students will do to demonstrate their understanding of the organizing principle? (Include information about content and format.) What cognitive levels will I prompt students to use?					
Revised Bloom’s Taxonomy (2001) and Corresponding Cognitive Tasks/Language Functions					
Remembering	Understanding	Applying	Analyzing	Evaluating	Creating
List	Interpret	Apply	Analyze/ Deconstruct	Critique	Create
Recall / Retell	Infer	Experiment	Identify Cause & Effect	Evaluate / Judge	Plan/Construct
Sequence	Predict	Calculate	Compare & Contrast	Hypothesize / Formulate Questions	Produce
Describe	Summarize	Classify & Categorize	Identify Main Idea & Supporting Detail	Take & Support a Position	
Language Function(s) What Language Function(s) highlighted above will I take to practice for the Expressive Task?					
Accessing and Developing Background Knowledge Identify important topic-related concepts/vocabulary (mostly Tier 3) taught “Before” reading to achieve organizing principle. (Code NC or DC for New or Developing Concepts and NL for New Labels.)					
Vocabulary Taught “During” Reading (Tier 2 and 1 words taught as “step asides”) (Code “C” for Cognates or “M” for Morphology as appropriate for any words listed above.)					
Text Features That Support Comprehension (Headings, captions, illustrations, charts, graphs, etc.)			Text Structure (Organization of ideas, signal words, grammatical features) that will enhance and/or impede comprehension		

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TAB 4: Purpose and Rationale for Using the Text and Task Analysis Template

155

Figure 3: Lesson Text and Task Analysis Template. *Note.* From *Results: Academic Language and Literacy Instruction K-6 Teacher’s Handbook* (p. 155) by M. Adams and J. Shefelbine. Copyright 2011 by California Reading and Literature Project, University of California. Reprinted with permission.

Lesson planning followed the text and task analysis. The lesson plans contained core instructional routines and supplemental strategies. In support of the idea that “less is more,” the CRLP-Region 8 Director recommended selecting a number of research-aligned, “core” instructional routines to be used consistently in the “Before,” “During,” and “After” reading stages of instruction as shown in Figure 4, Figure 5, Figure 6, and Figure 7.

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RESULTS: Academic Language and Literacy Instruction K-6
Supporting Implementation of the Common Core State Standards

6.2 – Lesson Planner

Subject: _____ Grade: _____ Title/Chapter/Page(s): _____

Preparation from TTAT:	
<input type="checkbox"/> Organizing Principle	<input type="checkbox"/> Expressive Task(s)
<input type="checkbox"/> Receptive Task	<input type="checkbox"/> Vocabulary Taught "During Reading"
DURING READING	
Facilitate Comprehension	
<p>Comprehension Monitoring:</p> <p>6a. Setting and Monitoring the Purpose for Reading How does what you've just read (or heard) relate to your purpose for reading (listening)? (And other open-ended content-focused questions to foster instructional discussions about the topic)</p> <p>6b. Self-Checking for Understanding</p> <ul style="list-style-type: none"> • Can you use your own words to say or retell what you just read (heard)? • Can you organize the information that you just read (heard)? • Can you summarize what you just read (heard)? <p>6c. Employing Fix-Up Strategies Which part(s) do you not understand and what fix-up strategies could you use? Teacher selects the fix-up strategy that best fits the problem:</p> <ul style="list-style-type: none"> • Rereading • Reading ahead • Deconstructing complex syntax • Identifying signal words • Finding out the meanings of key words through marginal glosses, the glossary, dictionary, or through structural analysis (morphology) • Finding a simpler text • Asking for help from teacher/peer <p>7. Vocabulary "Step Asides"</p> <ul style="list-style-type: none"> • Tier 1 and Tier 2 explanations • Text structure signal words • Cognates • Morphology <p>8. Levels of Organization – Story Grammar and /or Optional Scaffolded Outlining for 3-6</p>	
Motivation and Engagement are Influenced by: Success, Pleasure, Relevance, and Purpose	

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Figure 5: During Reading Lesson Planner. Note. From *Results: Academic Language and Literacy Instruction K-6 Teacher's Handbook* (p. 178) by California Reading and Literature Project. Copyright 2011 by California Reading and Literature Project, University of California. Reprinted with permission.

7.1 – Lesson Planner

Subject: _____ Grade: _____ Title/Chapter/Page(s): _____

Preparation from TIAT: <input type="checkbox"/> Expressive Task(s) <input type="checkbox"/> Language Functions/Cognitive Tasks
AFTER READING
Scaffolding the Expressive Task
9. Structured Language Practice with Functional Language Patterns <ul style="list-style-type: none"> What language patterns will you teach or review to scaffold the expressive task(s) linked to the language function? (Use worksheet 7.2) What familiar topic will you use to practice the patterns?
10. Graphic Organizer for the Expressive Task Scaffold the expressive task by adding important information to the original HGO or by constructing a new graphic organizer:
11. Content Conversation Linked to the Expressive Task <ul style="list-style-type: none"> Post the expressive task from the TIAT and have students practice linking topic-specific vocabulary from the graphic organizer(s) with the functional language patterns they practiced in Step 9, first orally and then in writing (as appropriate) Write out the evaluative criteria you will share with students:
After Completion and Evaluation for the Expressive Task
12. Provide Feedback to Students Evaluate student work and write out the feedback you will give to the class and/or subgroups, with strengths and instructional needs:
Motivation and Engagement are influenced by: Success, Pleasure, Relevance, and Purpose

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TAB 7: After Reading

185

Figure 6: After Reading Lesson Planner. Note. From *Results: Academic Language and Literacy Instruction K-6 Teacher's Handbook* (p. 185) by California Reading and Literature Project. Copyright 2011 by California Reading and Literature Project, University of California. Reprinted with permission.

RESULTS: Academic language and literacy instruction K-6
Supporting Implementation of the Common Core State Standards

7.2 – Functional Language Patterns Worksheet

Text:

Target Function:

Comprehension question(s) or other student output expectations – What do you want students to <u>do</u> ?		
DIFFERENTIATED TEACHER PROMPTS		
Beginning/Early Intermediate	Intermediate	Early Advanced/Advanced
DIFFERENTIATED STUDENT RESPONSES TO TEACHER PROMPTS		
Beginning/Early Intermediate	Intermediate	Early Advanced/Advanced
LANGUAGE PATTERNS BASED ON DESIRED STUDENT RESPONSES		
Beginning/Early Intermediate	Intermediate	Early Advanced/Advanced
PRACTICE VOCABULARY TO USE WITH LANGUAGE PATTERNS		

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186

TAB 7: After Reading



Figure 7: Functional Language Patterns Worksheet. Note. From *Results: Academic Language and Literacy Instruction K-6 Teacher's Handbook* (p. 186) by California Reading and Literature Project. Copyright 2011 by California Reading and Literature Project, University of California. Reprinted with permission.

Results

Qualitative Analysis

The following questions analyzed five qualitative categories of strategies, impact, teacher comprehension, student comprehension, and administrator feedback.

1. What RALLI strategies (S) worked well in your classroom?
2. What impact (I) did participating in RALLI have on student achievement?
3. Did going through the RALLI training improve your confidence in teaching comprehension (TC) of informational text?
4. How did RALLI lessons affect your students' comprehension (StC) of informational text?
5. Administrator (A) feedback (Did you feel, as an administrator, that attending RALLI training with your team was beneficial to the implementation of the RALLI strategies?)

Below is a summary of teachers' qualitative responses that reflect the overall patterns in Table 1 (the complete analysis matrix is in Appendix B). The most frequently mentioned strategies that worked well were using the Hypothetical Graphic Organizer (HGO) and sentence frames. The most frequently mentioned impacts on student achievement were reading comprehension and writing. In the category of teachers' confidence in their comprehension, the participant teachers noted informational text, planning, and vocabulary most frequently. Student comprehension centered on reading comprehension and vocabulary. For administrators, collaboration clearly was the most salient aspect of RALLI.

CATEGORY	Most frequent response	Second most frequent response
Strategies	Hypothetical Graphic Organizer (HGO)	Sentence Frames
Impact	Reading comprehension	Writing
Teacher comprehension	Informational Text	Planning; Vocabulary
Student comprehension	Reading comprehension	Informational Text
Administrator	Collaboration	

Table 1: Analysis of Teachers' Qualitative Data

Quantitative Analysis

The teacher participants used the Smarter Balanced Informative Writing Rubric as shown previously in Figure 1 to assess their students' comprehension of the text. The highest score on the rubric was 4. To earn a score of 4, the student's written response had to include a main idea that was focused, clearly stated, and strongly maintained with evidence from sources that were smoothly integrated, comprehensive, and relevant.

The teacher participants who taught kindergarten had 140 students take the pre-assessment. Only eight students scored 3 of 4 points possible, and four students scored 4 of 4 points possible. After implementing RALLI core instructional routines, the kindergarten teachers saw some improvement in their students' scores on the post-assessment. The kindergarten teachers had 136 students complete the post-assessment. Four students were absent on the day students took the post-assessment. After scoring the post-assessment, 23 kindergarten students scored 3 and 11 kindergarten students scored 4 (see Figure 8).

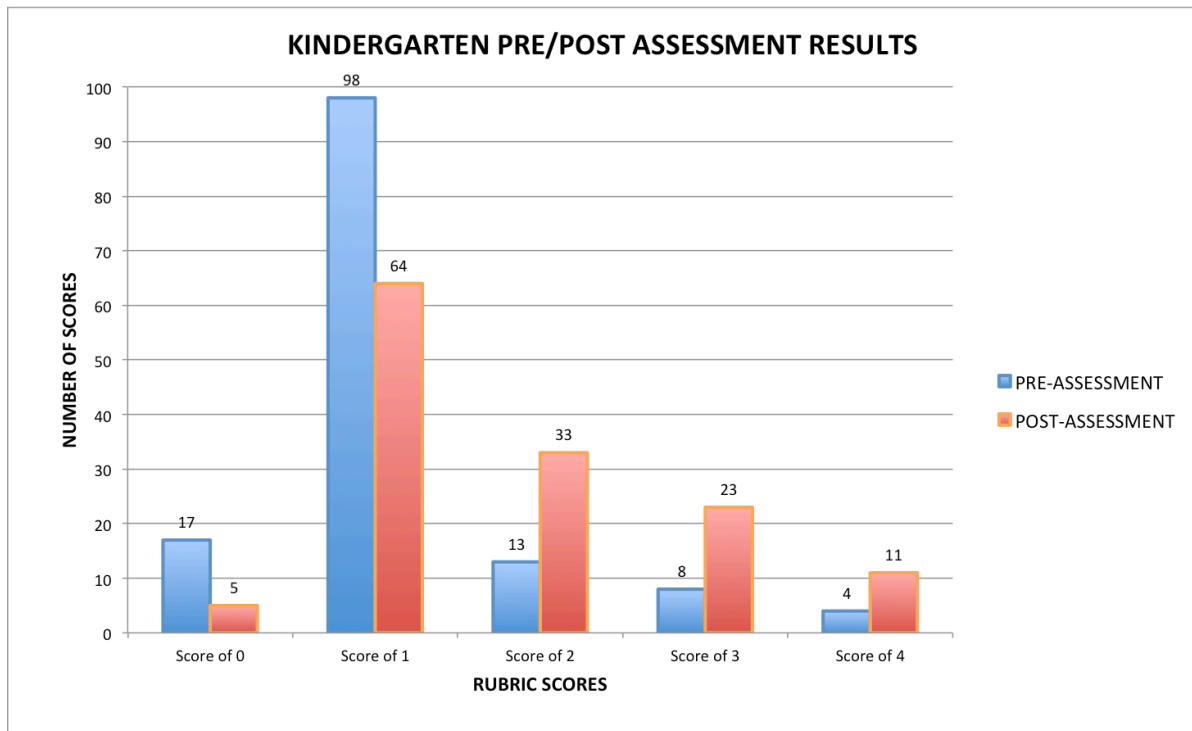


Figure 8: Kindergarten pre- and post-assessment scores.

One hundred twenty-one first grade students completed the pre-assessment. Eight students were absent on the day that students completed the pre-assessment. The pre-assessment results revealed 21 students scored 3 and four students scored 4. One hundred twenty-nine students completed the post-assessment. Forty-one students scored 3 and 10 students scored 4 on the post-assessment (see Figure 9).

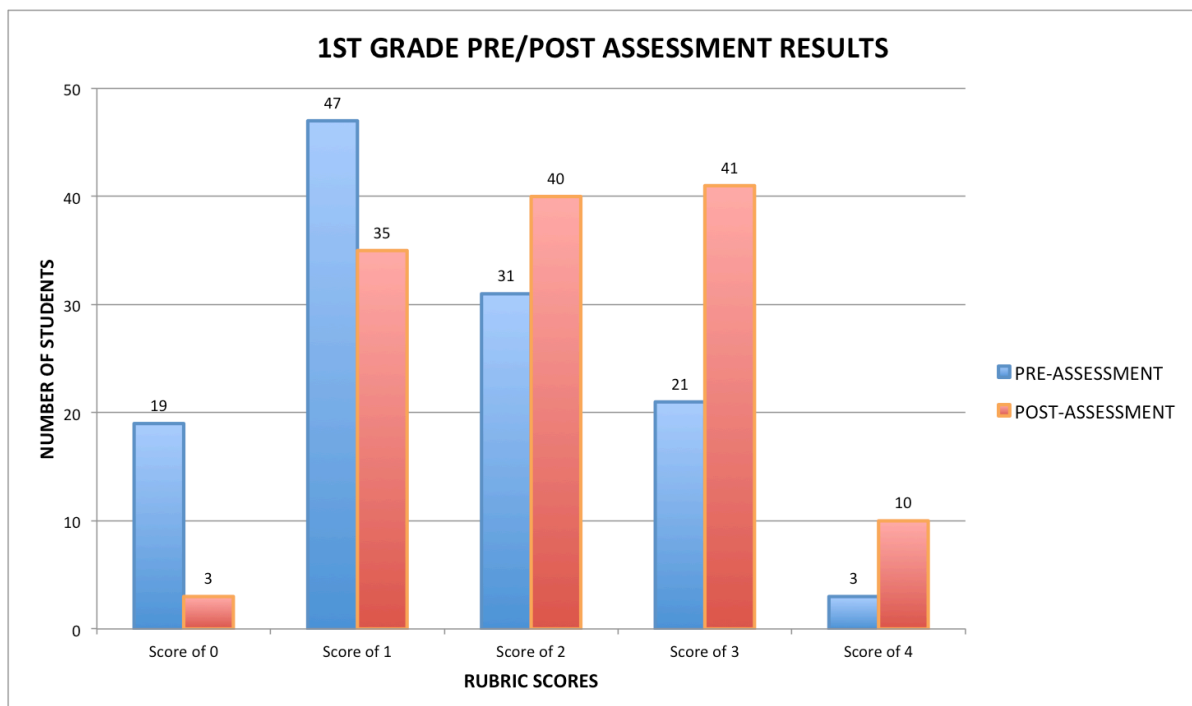


Figure 9: First grade pre- and post-assessment scores.

There were 193 second grade students who completed the pre-assessment. Twenty one students scored 3 on the pre-assessment and no students scored 4. The post-assessment results revealed 58 students scored 3 and 55 students scored 4. All students were present for the pre- and post-assessment (see Figure 10).

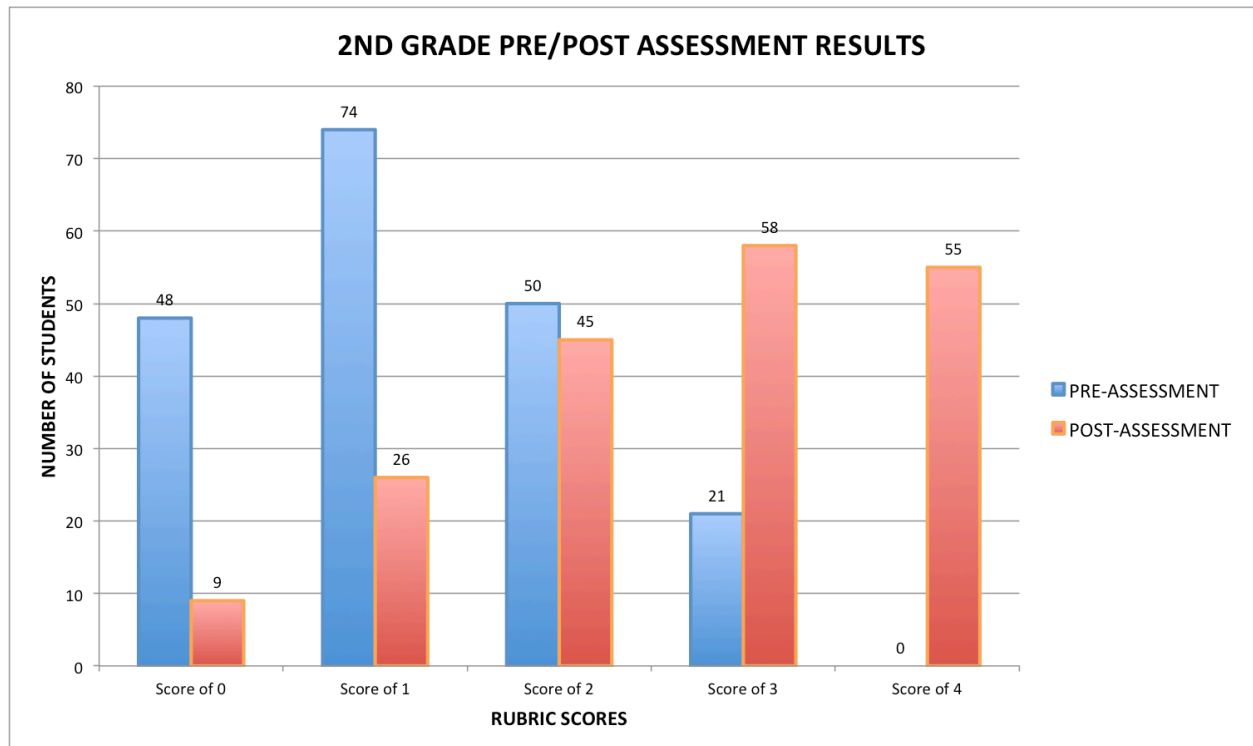


Figure 10: Second grade pre-and post-assessment scores.

Two hundred seventy third grade students completed the pre-assessment. Two students scored 4 and 41 students scored 3 on the pre-assessment. Two hundred fifty-nine third grade students completed the post-assessment. The post-assessment results revealed 94 students scored 3 and 39 students scored 4. Eleven students were absent on the day that students completed the post-assessment (see Figure 11).

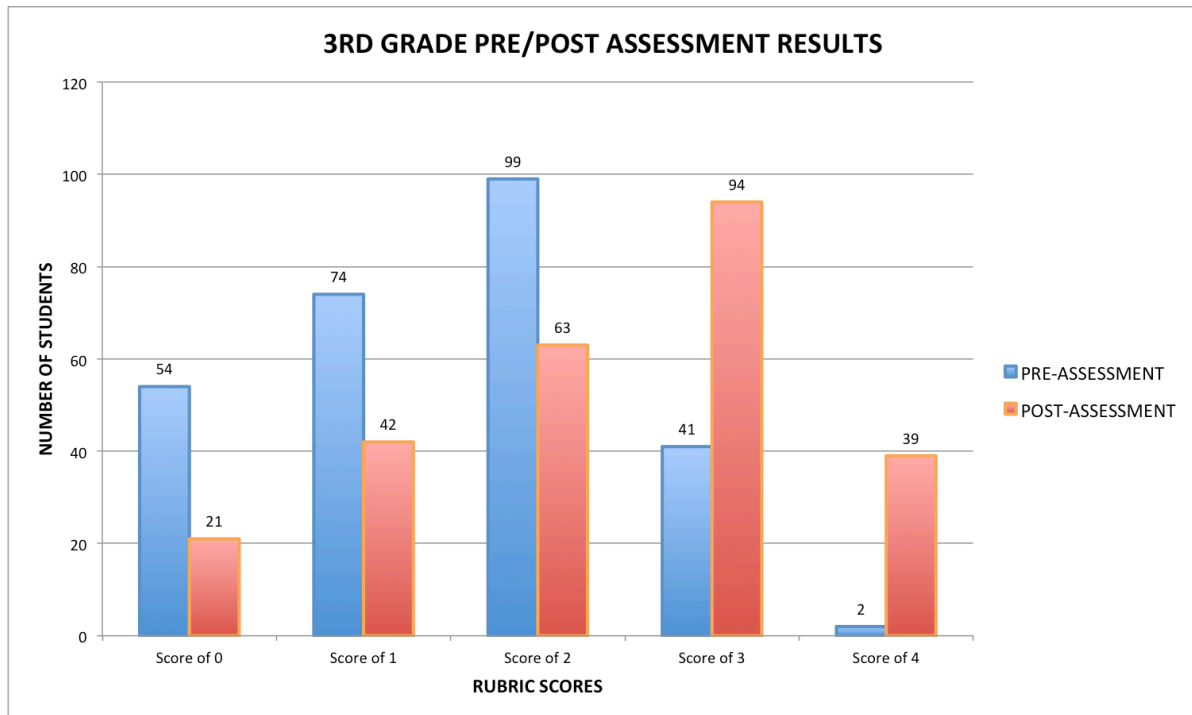


Figure 11: Third grade pre-and post- assessment scores.

One hundred thirty-four fourth and fifth grade students completed the pre-assessment. Two students scored 4 and 23 students scored 3. One hundred twenty-eight students completed the post-assessment. The post-assessment results revealed 36 students scored 3 and 32 students scored 4. Six students were absent on the day that students completed the post-assessment (see Figure 12).

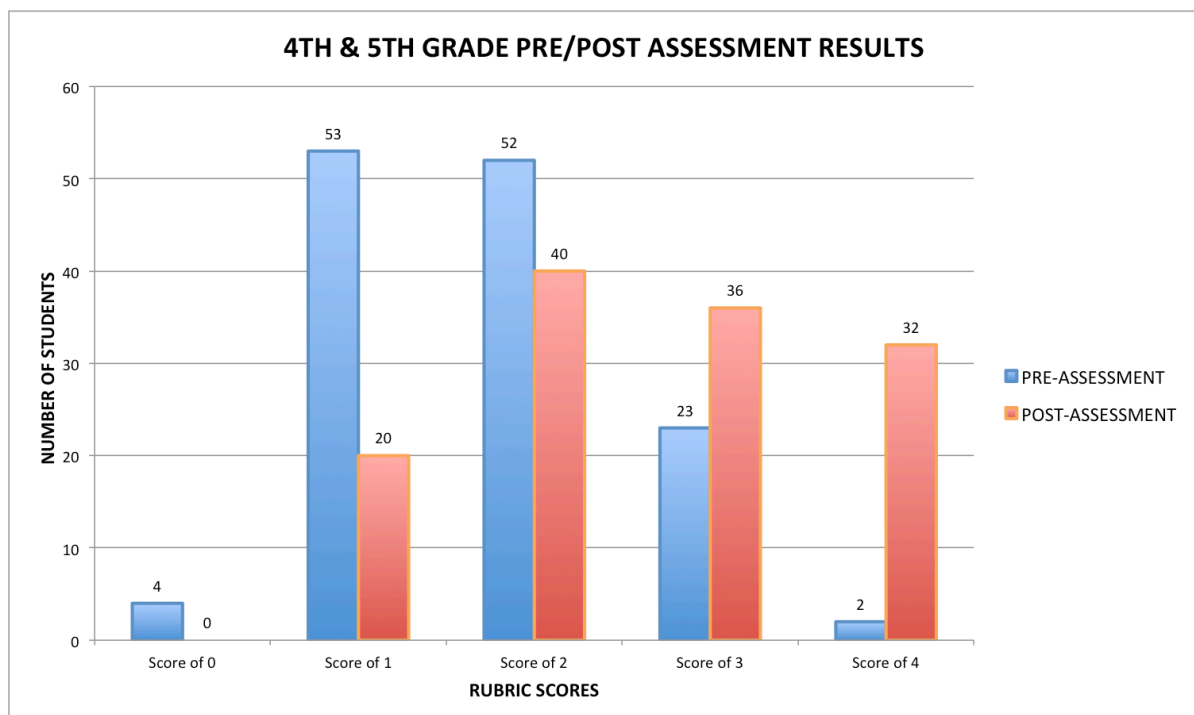


Figure 12: Fourth and Fifth Grade pre-and post-assessment scores.

Discussion

Upon completion of the RALLI institute, CRLP-Region 8 participants revealed through a qualitative survey that RALLI provided them with a comprehensive literacy framework that enabled them to identify specific factors that affected their students' overall literacy. RALLI also showed them how to effectively integrate academic language and literacy instruction throughout the instructional day and how to implement instructional strategies and routines that made complex informational text more accessible to their students. One participant wrote, "RALLI training improved my confidence in teaching comprehension of informational text." Another participant wrote, "RALLI forced me to step back and really analyze and dig deep into the subject matter/grade level material." To sum it up, one participant wrote that she not only "learned new strategies for teaching informational text," but she also "noticed a difference in students' ability to answer questions regarding the text."

In addition, students' post-assessment results show that RALLI strategies improved student's comprehension of complex text. All grade levels showed decreases in scores of 0 and 1 from pre- to post- assessment. Scores of 2 varied across grade levels from pre- to post-assessment. More kindergarten and first grade students scored 2 in the post-assessment compared to the pre-assessment while students in grades two through five showed decreases in scores of 2 from pre- to post- assessment. Furthermore, the improvements in scores of 3 and 4 from pre- to post- assessment are apparent across all grade levels. In all grade levels, more students scored 3 or 4 in post-assessment compared to students' pre-assessment, revealing RALLI strategies had a substantial impact on students' comprehension of complex informational texts.

Based on the participants' responses to the post-survey and students' post-assessment scores, we concluded that the implementation of RALLI strategies improved students' comprehension of complex informational texts and participating in RALLI positively impacted teacher efficacy.

Conclusion

Elementary school teachers in CRLP-Region 8 face many challenges, not the least of which is the diversity of languages and socio-economic backgrounds of their students. This diversity particularly impacts reading and literacy skills, a challenge that is only compounded given the rigorous expectations of California's mandated Common Core State Standards (CCSS). The College and Career Readiness Anchor Standard for Reading is one of the key requirements of the CCSS. It states that all students must be able to independently read and comprehend texts of steadily increasing complexity as they progressed through school. To address this comprehensive standard, RALLI focuses on routines that participants are able to apply to grade-level text, including literature and content area informational text. Given the beneficial effects on student reading comprehension and teacher empowerment as indicated by this study, CRLP-Region 8 plans to continue to enroll teacher participants in annual Action Research Group cohorts. We believe this program merits institutionalization as a model for sustained teacher collaboration in grade level teams that support the implementation of strategies and routines learned in the RALLI institute.

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Appendix A

Interview Questions

Did going through RALLI training improve your confidence in teaching complex informational texts?

Teacher's pseudonym	Teacher's grade	Years teaching	Response	Elaboration
Participant 1	1	11	Yes	Learned new strategies for teaching informational text; noticed a difference in students' ability to answer questions regarding the text
Participant 2	1	15	Yes	Forced me to step back and really analyze and dig deep into the subject matter/grade level material
Participant 3	3	5	Yes	Think about my teaching goals and what I wanted my students to learn
Participant 4	5	19	Yes	RALLI training improved my confidence in teaching comprehension of informational text.
Participant 5	3	2	Yes	RALLI training gave me new and effective strategies to engage my students in lessons. I feel that I was able to teach informational texts with more confidence.
Participant 6	3	8	Yes	I feel more confident teaching informational text.
Participant 7	2	23	Yes	RALLI training came at a time when we were looking at the common core standards and it tied well.
Participant 8	3	21	Yes	It gave me techniques I didn't use such as sentence frames.
Participant 9	4/5	23	Yes	Lots of the strategies were ones I've heard before, but it put it all together and gave teaching a more focused and logical process. HGO step gave my students confidence before even reading the text.
Participant 10	3	7	Yes	I liked the idea of using an HGO to preview the lesson.

Appendix B

Coding and Qualitative Data Analysis of Teacher Responses

	I D	What RALLI strategies (S) worked well in your classroom?	Verbatim Responses
S	6	BK	My entire language arts class is basic, below basic, or far below basic in language, and about 45% of my students are ELs, so building background knowledge, discussing vocabulary, using sentence frames, and providing a variety of visual aids was very beneficial for all of my students.
S	1 3	GrOrg	The graphic organizers and the way the lessons were rich with content and vocabulary was really beneficial to my students.
S	1	HGO	I really loved the HGOs. My students referred back to many of them throughout the year.
S	3	HGO	The HGO was very helpful. It sparked their interest, and the vocabulary that was taught increased their understanding of the text.
S	1 2	HGO	The use of the HGO and realia was a great way to introduce vocabulary and generate enthusiasm about the written text. Lots of oral practice within the language function increased academic language. Charting information as we read was helpful as well.
S	1 4	HGO	My students loved the HGO. They really, really appreciated the time that it took me to draw out and uncover what they were going to be learning. After I introduced the HGO for this last RALLI assignment, I had a student come up to me and say, "I'm glad you're my teacher." Kids get excited and love to learn when we are excited and love teaching. The HGO really brings learning to life.
S	1 5	HGO	The HGO was a great resource for my students to be able to refer back to as they progressed through the lesson. Students were much more familiar with the academic vocabulary necessary to complete the lessons.
S	1 6	HGO	The use of HGOs helped to engage my students in the topics I taught. They peaked their interest and kept them wanting to know more. I also noticed that by introducing the topic before reading the story and giving them background knowledge about the story really helped to engage them while they read or I read to them.
S	4	InfTxt	Students were engaged with the informational text. They were able to identify text features and effectively communicate their learning in complete sentences.
S	1 1	LangFun	I really liked the Language Functions. They gave a scaffold for the students to use in their oral conversations. Lots of higher-level discussion going on.
S	7	Lplans	The RALLI lesson plans made me really think about my teaching goals, which was beneficial because it gave my teaching a very specific and meaningful purpose.
S	2	RecEx	I loved the receptive/expressive tasks. My students were

			more engaged in their learning. There were less questions about what we were going to do and a greater focus on what we were reading.
S	6	Sframes	My entire language arts class is basic, below basic, or far below basic in language, and about 45% of my students are ELs, so building background knowledge, discussing vocabulary, using sentence frames, and providing a variety of visual aids was very beneficial for all of my students.
S	8	Sframes	The sentence frames (language patterns) were very beneficial. The students liked using them, and it gave all levels of students' vocabulary to build complex sentences.
S	9	Sframes	Using the language functions section of the binder and displaying sentence frames for our class discussions made all the difference. I think that having a strong purpose for the lesson in the organizing principle was important for me as well.
S	10	Think/Pr/Sh	I liked the opportunity to do Think/Pair/Share. It was a great reminder that our children have to talk about what they are learning. Doing worksheets is just busy work. They were so excited to have the opportunity to talk about what they were learning, and it helped with their comprehension.
S	6	VisAids	My entire language arts class is basic, below basic, or far below basic in language, and about 45% of my students are ELs, so building background knowledge, discussing vocabulary, using sentence frames, and providing a variety of visual aids was very beneficial for all of my students.
S	5	Voc	Building background vocabulary helped my EL students feel more involved in the learning process.
S	6	Voc	My entire language arts class is basic, below basic, or far below basic in language, and about 45% of my students are ELs, so building background knowledge, discussing vocabulary, using sentence frames, and providing a variety of visual aids was very beneficial for all of my students.
I	x	What impact (I) did participating in RALLI have on student achievement?	
I	3	+	All of my students did better with have RALLI instruction.
I	12	+	Students really enjoyed the lessons and were very engaged. I enjoyed presenting the lessons and they got more from that.
I	4	Memory	My students seemed to retain more information after using the RALLI strategies.
I	2	ReadComp	Participating in RALLI made me more aware of what I needed to do to prepare my students for texts that they were going to read or listen to. As a result, their comprehension scores improved.
I	5	ReadComp	I think that my students had a sense of confidence after the lesson. They were able to understanding the text and could talk about it in an intelligent way.
I	1	ReadComp	My students were able to improve in many areas of their

	0		reading comprehension. They were exposed to high level vocabulary, and I felt that I was able to provide them with several opportunities to engage in high level conversations with their peers. With the strategies I learned at RALLI, I hope to continue preparing them to be competent in the 21 st century.
I	11	ReadComp	Students became more active readers, and consciously read for a purpose.
I	7	Reading	I think using these strategies has given the children more confidence as readers.
I	8	Voc	The impact (of RALLI on student achievement) was clearly during the expressive task. The vocabulary and information they were able to dictate to me was very high level.
I	1	Voc	I feel my students have a deeper understanding of vocabulary because now I am more aware of teaching it more specifically.
I	6	Writing	Practicing the language functions orally really improved their writing on the subject.
I	9	Writing	Lots of oral practice embedded the skills and vocabulary, before students started writing. All students made growth with the paragraph assessment.
I	13	Writing	My students truly benefitted from RALLI. I have implemented RALLI strategies in every content area, and it has affected my students' perception of informational text. They love when they see an HGO coming up, are interested in checking out more informational texts (because of positive experiences in class), and it has helped their writing incredibly.
TC	x	Did going through the RALLI training improve your confidence in teaching comprehension (TC) of informational text?	
TC	7	Comcore	I think going through the RALLI training was helpful because it comes at a time when we are looking at the common core standards, and it ties in well.
TC	5	Engage	I feel that RALLI training gave me new and effective strategies to engage my students in lessons.
TC	1	InfoTxt	I learned new strategies for teaching informational text and definitely noticed a difference in my students' ability to answer questions regarding the text. My students were using the correct vocabulary and able to write detailed sentences staying on topic.
TC	4	InfoTxt	RALLI training improved my confidence in teaching comprehension of informational text. I felt better prepared to organize the information that allowed students to comprehend the material to a higher degree. Students were more focused during the reading.
TC	6	InfoTxt	I feel more confident teaching informational text. I do believe my students have a better understanding, and they were more confident with the expressive task.

TC	10	InfoTxt	Going through RALLI training has definitely improved my ability to successfully teach comprehension of informational text. I found that the process of planning for my lessons was really clear, and it allowed me the opportunity to analyze the different components from another angle. The proof was when I saw my students' faces light up when exposed to the new information.
TC	3	Plan	It really made me think about my teaching goals and what I wanted my students to learn. It also gave me a very clear and well prepared format to follow.
TC	9	Plan	I love being able to collaborate and plan with other teachers. The strategies did improve my confidence as a teacher to increase student learning.
TC	12	Purpose	RALLI made me aware of how important a purpose is for the students to have before reading any text.
TC	11	SentFr	RALLI gave me more tools to use in order to make the text more meaningful and interesting for my students. It also gave me a lot of opportunities to check for understanding. The think-pair-shares let me know if my class was on target with understanding the information. The topic focus (as something to keep referring to) helped me stay on track. The HGOs put information in a very easy (visual) way for my kids to understand the vocabulary and text structure. It was also a good tool to check for understanding after the reading. The sentence frames really helped my children use academic language and having different levels of sentence frames helped all of my children feel confident and challenged when discussing (rest did not copy clearly).
TC	2	SubjLevel	It forced me to step back and really analyze and dig deep into the subject matter / grade level material being taught.
TC	8	Voc	Now I can easily point out text features, significant academic vocabulary, etc. during the pre-read. Also, I am sold on the power of the HGO as a teaching / learning tool.
TC	11	Voc	RALLI gave me more tools to use in order to make the text more meaningful and interesting for my students. It also gave me a lot of opportunities to check for understanding. The think-pair-shares let me know if my class was on target with understanding the information. The topic focus (as something to keep referring to) helped me stay on track. The HGOs put information in a very easy (visual) way for my kids to understand the vocabulary and text structure. It was also a good tool to check for understanding after the reading. The sentence frames really helped my children use academic language and having different levels of sentence frames helped all of my children feel confident and challenged when discussing (rest did not copy clearly).
StC	x	How did RALLI lessons affect your students' comprehension (StC) of informational text?	
StC	4	Comp	The lessons helped my EL's organize their ideas, it helped build their vocabulary. It helped all students see that there

			is a purpose for writing.
StC	7	Comp	It improved their comprehension. They were able to orally express their comprehension to me and their classmates, as well as write about it in the expressive task.
StC	9	Comp	The students were more confident and really felt like they knew what they just read. Also, transferring what they read to the writing was easier. The students had all the info that they needed to make for complete paragraphs in their writing.
StC	10	Comp	My students truly benefitted from the RALLI lessons. Their comprehension went up drastically, they were more engaged in the lesson, wanted to learn more after the lesson was complete, and their ability to write about the topic was unparalleled. Their learning truly came out in their writing. They used the key vocabulary, remembered complex information, and overall, wrote more than they typically were able to produce. Also, besides for writing, I also had them draw when they were done. It was amazing, their pictures had detail that reflected the HGO and text that they were now very knowledgeable about.
StC	8	Engage	My students were very engaged throughout all of the lesson. They enjoyed the challenges I provided them with the support.
StC	1	InfoTxt	I feel my students have a greater understanding of informational text after using RALLI strategies. I notice a huge difference when I do not teach with RALLI strategies and when I do.
StC	3	InfoTxt	Doing RALLI lessons with my students gave them a large boost of confidence in discussing and engaging with informational text. I loved seeing their engagement and excitement with the whole group lessons.
StC	5	InfoTxt	My students love informational text. They are always looking for the things we have learned. They share with each other and are always excited for more.
StC	6	InfoTxt	The students approached the informational texts with more tools to help them understand the passage – as in vocabulary, how to use text features, sentences frames.
StC	2	Memory	Overall, my students seemed to retain learning/information better after RALLI strategies were implemented.
A	x	Administrator (A) feedback (did you feel, as an administrator, that attending RALLI training with your team was beneficial to the implementation of the RALLI strategies?)	
A	x	.	Yes, definitely it was beneficial.
A	1	Collab	Teachers need to see that we're learners as well.
A	2	Collab	As an administrator you learn and understand what the teachers are as well so there can be that common understanding and support. This provides the opportunity for good rich conversations.

A	3	Collab	In order to move your faculty in a new direction or new learning, you must have the same knowledge and skills so you need the training.
A	4	Collab	By learning with your teachers, you no longer are just an evaluator. You become a partner in learning and can be a second set of eyes in the classroom for productive feedback.
A	5	Collab	Yes. Attending the training has given me the opportunity to work side by side with my teachers and has provided me with the tools necessary to support them. It is imperative that administrators attend staff development trainings with their staff.
A	x	Administrator feedback (Did you see a boost in confidence in you RALLI Action Research Team after they completed RALLI training?)	
A	6	Collab	Absolutely! They are using what they learned and are sharing with other staff members who didn't have the opportunity to attend the RALLI training. They invite me to their classrooms to see their lessons and are eager to share lesson plans they have created for RALLI.



Problem-Based Learning as a TEFL Context in a Futuristic Democratic Society

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Abstract

Teaching English as a Foreign Language (TEFL contexts in the pre- university education stages in Egypt are almost traditional. Learning /teaching are almost based on a teacher-centered rather than a student- centered approach. It does not create students' feeling of belonging to their society, nor does it enhance the required characteristics for a global citizen. On the contrary, English Language Teaching (ELT) should initiate civic-literacy and configure the framework for civic learning and democratic values. The purpose of this study is to explore the basic concepts and core learning/teaching strategies of ELT for democratic citizenship. To ensure the students' critical attitudes and positive initiatives, a Problem – Based Learning (PBL) approach can be integrated into ELT. It entails that learning process components need to be revised. Besides, different democratic concepts, values and practices should replace the traditional concepts of knowledge, intended learning outcomes, and knowledge management. PBL may provide the openness and richness of a democratic context. It represents a prerequisite for life in a democratic society. Hence, the students' personal, linguistic, cognitive, and social characteristics can be changed. Accordingly, the expected change of the students' performance will be reflected on their lives and their futuristic democratic society.

Key words: student-centered approach, a global citizen, democratic society, civic literacy

Introduction

Over the last two decades, there has been a shift in learning paradigms that reflects a worldwide interest in increasing recognition of learning democratic concepts and values, and citizenship practices. In many countries education emphasizes the importance of the concept of "citizenship", both nationally to highlight belonging and, internationally to extend a deeper understanding of global citizenship. Education is often the suggested context for enhancing and extending the concept of citizenship. However, the challenge lies in the educational policy, whether to involve democratic components and citizenship practices in contents and activities.

With the gradual movement of the Egyptian society towards democracy, the perspectives of education should be different. The educational system, i.e., curriculum, intended learning be outcomes, contents, learning strategies, and assessment techniques, should integrate civic-literacy with the educational context. The purpose of this system is to support knowledge, values, and practices of democracy. Educational aims should be revised to cope with the characteristics of a global citizen who is required to contribute positively to the development of a democratic society. It implies that students should be encouraged to contribute to instruction and link their interests to learning activities (Zhou et al., 2009). Teachers should provide a context in which students relate their interests to the knowledge they manage. Guthire & Klauda (2014) view curricula, students' attempts to build up their knowledge, through PBL practices, and teachers' tutoring, as reflective issues that transmit life into the classroom. Nag (2011) views PBL as an approach that reinforces the self-reflective nature of learning, which sharpens students' life skills.

Figure (1): PBL should integrate knowledge and civic-literacy through group dynamics in an interactive context



In the researcher's viewpoint, PBL represents one of the possible alternatives that can contribute to the mobilization towards socially and educationally different scenes, with a qualified global citizen for a democratic society. Scott (2014) analyzes PBL, as a learning approach into different components of: context, students, and the

teacher. This may suggest that some privileges of PBL; such as problem authenticity, problem familiarity, self-directed learning, team autonomy and diversity, and team collaboration provide further freedom of action.

PBL in a Democratic Society

In PBL, learning is an interactive process in which participants mutually engage in dialog. Hence, questioning becomes a dominant feature. Questions often increase the students' enthusiasm and create a meaningful sharing of responsibility for learning. Students are exposed to the richness of analytical and critical openness, which increases their abilities of suggesting various alternatives, making decisions and finding priorities. Accordingly, collaborative work is important for students to reflect the group dynamics, open discussion, and sharing meanings, and responsibilities. This scene can create a competitive critical environment in which students experience enjoyable learning. This scene represents preliminary attempts for practicing democracy outside the school.

PBL is not a linear process in which inputs and outputs are predetermined, and students should be trained on some mechanical drills. However, it is a dynamic process in which students interact with authentic knowledge components. These components are different in every learning context, according to the students' needs, perception of the problem, learning objectives, priorities, and, ways of knowledge management.

Figure (2): Usual learning as a linear process

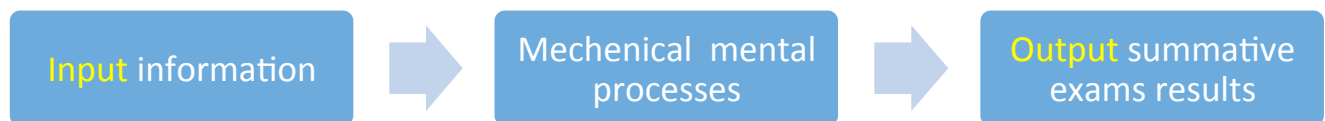


Figure (3) PBL is a dynamic process



Autonomous learning provides a path through which the democratic practices can be established. (Duch, Groh, & Allen (Eds.) (2001) refer to PBL as an instructional

method that challenges students to “learn to learn” through their cooperative work as a means to seek solutions for real world problems. They engage their curiosity and initiate learning the subject matter. PBL prepares students to think critically and analytically, and to find and use appropriate learning resources.

In the present study, the concept of PBL, including the critical nature of knowledge, the collaborative-learning strategies and the inquiry activities, contribute to the schools intentional attempts to create global citizens. In an authentic context, learning is not a mere process to, passively, receive information to be kept in mind to pass exams. On the contrary, students should be participants in their learning environment. They have to determine their priorities and make decisions, as preliminary activities to practice in their communities, where they are required to take social responsibilities. Tittle (2011) argues that learners, in their practice of critical thinking will have more autonomy, independence, and freedom than people who just go with the flow and, accept whatever is given to them. He also suggests that becoming good citizens: not only will people see the problems in society, but they will, hopefully, see the solutions. In this respect, people might consider it as their duty to be critical thinkers. In a democratic learning environment, learners do not take information for granted; however, it is purposefully and critically managed. Citizens of democratic societies should select, elect and think about what should /should not exist.

PBL learning context components need to adopt an autonomous learning procedure in which students learn how to build up and criticize meaning. Barrett (2005) refers to PBL as “both a curriculum and a process. The curriculum consists of carefully selected and designed problems that demand from the learner acquisition of critical knowledge, problem-solving proficiency, self-directed learning strategies and team participation skills. The process replicates the commonly used systematic approach for resolving problems or meeting challenges that are encountered in life and career” (p14).

The Power of Knowledge in a Democratic Society

In conventional communities, students are considered blank sheets of papers. During their schooling years, they had to be prepared for exams just to get their certificates and to find jobs. In such communities, students should not be expected to act positively to participate in social services. However, it is not the case of democratic societies in which students are empowered to practice democracy through classroom collaborative activities. Svinicki (2007) refuses to view students “as blank slates on which our words are inscribed”. She adds that “students bring more to the interpretation of the situation than we realize. What they learn is conditioned by what they already know. What they know can be as damaging as what they don't know” (p.2)

Students' initiatives are the real starting point for learning. In PBL, students encounter ill-structured problems, or debatable issues that elicit thinking and different learning acts such as; inquiry, navigation, collaboration with other team members, brainstorming, mind-mapping ideas and other positive actions. However, what they know in a particular moment may have value than what they actually need to know, and the relevant knowledge they can actually produce. It represents a challenge for constructing meaning for learning. This interactive process of give and take motivates

the learners for further investigation. In other words, knowledge should not be prescribed and pre-determined with ready-made old concepts suggested by specialized experts as usual, because most of them have old beliefs that do not match with the needs of young people or their requirements. However, students' needs for critical knowledge should be determined by the students within a national, cultural, global, and educational framework. Furthermore, civic-literacy components should be recognized as a prerequisite for students' preparation. According to an Eric report (2013) that suggests PBL as a vital approach for engaging students to become active citizens in building their communities they need to:

1. "build global knowledge networks and authentic learning milieus to bring democratic changes in their communities;
2. understand critical communication possibilities and potentials about social justice issues for lifelong learning to recreate dialogical and democratic forms of pedagogy and community engagement; and
3. explore powerful democratic communicational practices that promote dialogues between them, augment cognitive learning skills and generate motivations for multi-generational participations "(p. 2)

PBL and Citizenship in a Democratic Society

The role of education is to prepare citizens for life. The term 'citizenship' should be reconceptualized. Besides, a strong feeling of belonging to a particular geographic, historical, and social identity, students should contribute to the welfare of their country. 'Francois et al., (2002) asserts that "even, in the conventional societies, curricula should consider authenticity and current themes to cope with worldwide changes" (p.9). They explain that a citizenship should move from a conception of citizenship that emphasizes the "feeling of belonging and obedience to the collective rules, to a more individualistic and more instrumental conception of citizenship. (p.9). In the absence of personal as well as collaborative connection, students' engagement declines, leading to disengagement (Griffiths, Lilles, Furlong& Sidhwa, 2012).

The National Task Force on Civic Learning and Democratic Engagement (2012) report titled 'A: Crucible Moment: College Learning and Democracy's Future' suggests four levels for civic literacy, i.e. knowledge; to ensure students' awareness of basic concepts, values; to manage with the ethical components of democracy, and collective action; for practicing civic inquiry as part of life and work demands for the 21st century democratic society.

Though, knowledge, belonging, capacity to tolerate others, and to resolve possible conflicts according to social constraints and laws are necessary for positive participation in democratic societies, which are absent in traditional learning contexts. However, practicing citizenship is a comprehensive task that elicits the co-operation of multifaceted formal and informal settings, and media resources to provide what should positively affect the learners' convictions and attitudes towards democracy. It is also awareness of curriculum designers to consider democratic positive concepts that pave the way for simple democratic practices in the educational institute and, in the society.

English Language Contexts and PBL in a Democratic Society

The application of PBL starts with concept attainment. Determining concept meaning can be done through collaborative work, brainstorming, and presenting what the students know, and making decisions regarding what they should investigate. It increases the students' awareness of the complexity of real life.

The power of critical knowledge lies in developing the students' autonomous learning strategies that increases the ability of decision-making and determining priorities. In nondemocratic societies, English language learners are submitted to what is called "getting knowledge" that refers to the transmission of knowledge and the authoritarian attitude of the teacher. Accordingly, the end product is a citizen, who does not often possess initiatives. A person who is unable to identify rights and duties; who does not think of the others' rights, nor tolerate them; who cannot share responsibilities with them, nor even engage in collaborative work.

In ELT, autonomous learning is a necessary concept for creating self-confidence and accordingly, self-expression. A mere curriculum design cannot develop the students' cognitive responsibility of constructing an understanding of language concepts. However, autonomous learners, who can believe in their powers as creators of knowledge, and being at the frontiers of practice, can develop their cognitive abilities. Ong, (2012). Language teachers should encourage students to set the statement of the debatable issues, and start investigating their prior knowledge to find answers for expected question marks. "Through the freedom of action provided by PBL, students can vary the techniques for knowledge management according to their individual preferences, problem authenticity, problem familiarity/complexity, as well as research "Ong (ibid.p.12)

PBL application starts with concept attainment. In English language learning, it takes place through collaborative work, brainstorming, and making decisions regarding what students should investigate. It increases the students' awareness of the complexity of the real world issues, which enhances hands-on activities to solve problems. In PBL, students create awareness, collect information, and analyze ideas and their interrelationships of a text. They also find priorities of solutions, learn how to defend their viewpoints, and at the same time, accept or refuse the ideas of others in an argumentative context. At the same time, they can start further investigation, because all the answers are not final, and somebody else may add or modify the current solutions.

In language learning, questioning strategies represent a prominent feature for critical knowledge. Postman and Weingarten (2013) investigated the importance of inquiry through asking relevant and appropriate questions. Still, further investigation is needed to answer more difficult questions rather than settling for simplistic answers

English language learning/teaching is a necessary context for self-expression. Old methodologies, emergent in the 20th century do not match with the new reality of the 21st century. More progressive concepts such as critical knowledge, students' initiatives, self-expression, self-learning, inquiry, group dynamics, collaborative learning, technological attainment, and authenticity should replace the old ones.

PBL application starts with concept attainment. In English language learning, it takes place through collaborative work, brainstorming, and making decisions regarding what students should investigate. It increases the students' awareness of the complexity of the real world issues, which enhances hands-on activities to solve problems. In PBL, students create awareness, collect the information, and analyze ideas and their interrelationships of a text. They also find priorities of solutions, learn how to defend their viewpoints, and at the same time, accept or refuse the others' ideas in an argumentative context. At the same time, they start further investigation because all the answers are not final, and somebody else will add or modify the current solutions.

One of the most important techniques of PBL in language learning is 'problem-solving' in which students attempt to seek out the problem from different perspectives. All alternatives are discussed and analyzed to arrive at consensus/compromise.

The researcher suggests the following pedagogic and democratic values and practices:

1. Establishing persuasive, argumentative and debatable processes to provide for self-expression.
2. Acceptance/refusal of others' suggestions with no reference to failure or winning.
3. Criticizing, agreement/ refusal of own or others' ideas are not personal issues.
4. Seeking knowledge, not a mere getting of information, is a preliminary activity for further learning.
5. Mutual understanding, tolerance and respect of others are dominant features of learning.

Furthermore, argumentation, engagement in debates, raising questions, presenting ideas, reflecting and mind-mapping ideas, revising reports and wrapping up of debates, defending own viewpoint, and considering the viewpoints of others, persuasion, seeking knowledge for evidence, finding priorities, making decisions, and feeling satisfaction with the groups' final decision, are all prerequisites that can enhance language learning and support democratic practices.

Testing critical knowledge is different from standardized tests. It cannot separate knowledge into tiny pieces of information stored for exams' purpose. However, the knowledge acquired in an authentic PBL context is validated through the implementation of possibilities and the students' ability to make it fruitful for them and the others. MCQ tests cannot match the intellectual, social, and pedagogic components taking place in this non-conventional context. Nevertheless, narration, telling stories, paper/electronic portfolios, role playing, and conducting projects are possible techniques for assessment. "Those who innovate learning strategies must be ready to adjust new assessment strategies, otherwise, the purpose of the entire enterprise may well be defeated" (Lombardy, 2012).

The teacher is a facilitator, and a tutor, however, s/he is not a resource for information. Barrows and Hmelo-Silver (2005) suggest some strategies through which the teacher ensures positive student engagement in the learning process. Through asking students to summarize, draw charts, and generate hypotheses to help them focus their inquiries to the required knowledge learners' engagement can be increased.

To attain concepts, analyze and criticize them, technological contexts represent a good medium for rapid interchange, Richardson (2009) sees that the weblog is a

democratic tool that supports different learning styles for students. He suggests some technological devices such as blogs, wikis, podcasts, and social networks to render learning independent of time and space.

To wrap up, 'citizenship' is not a mere social concept. However, it has pedagogic, political, cultural, critical and, linguistic reflections. Duerr, Spajic-Verkas, and Martins.(2000) confirm that "the term "citizen" firstly, does not merely imply a legal status within the political system; rather, it implies competences, skills and capabilities that must be transmitted in a lifelong learning process". Fostering the civic concept is not an issue to practice in learning institutions, however, various social, cultural, and political institutions, as well as, art and media are all partners in this responsibility.

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Analyzing Children's Drawings

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Abstract

It is natural for a child to love drawing. The children's works reflect their feelings, thoughts, and actions that were going through their minds. The purpose of this study is to investigate any meaningful expressions in the themes in children's drawings. The study uses case study, non-participant observation, and paper analysis methods of study to collect the data. After five months' study, the results found are as follows: (1) drawings' images reflect children's imagination and creativity, (2) children draw images of the things related to their lives, (3) drawings' images reflect the children's worries and concerns, and (4) children draw image of what they are feeling but not what they are seeing.

Key Words: children's drawings , image

Introduction

Research Motivations

Children innately enjoy drawing. Children's drawings are typically simple and straightforward, and reflect their psychological condition. At the early stages of childhood, children's drawings are equivalent to their language, and characters illustrated in their drawings portray their mental images or self-portraits. Consequently, "people" has generally been the theme that is most favored by children.

Early childhood is a key period in individual development. In this period, children acquire numerous essential experiences that facilitate their growth process, which are presented by children through various methods. Drawing is a unique characterization method used in children's early childhood development process, and the first recognizable drawing illustrated by a child typically amuses adults. Children's drawings demonstrate similar functions and properties as spoken language. Therefore, these drawing have been considered to be a type of picture language by education experts, psychologists, and artists. However, the difference between spoken language and picture language is that drawings include personal and distinct methods of expression and intrinsic thoughts (Golomb, 2003). Thus, drawing activities play an integral role in the development process of children.

Thompson (1995) emphasized that words indicate or promote how children manage their works, thereby facilitating the consolidation or conveyance of their ideas. Therefore, in the process of understanding children's drawings, words that demonstrate personal or social functions are key factors in determining children's nature and their early symbolic development.

Thus, drawings are children's behavioral and dialectical expressions, and their mental and ideological presentations. Children's drawings typically exhibit personal meaning, and present various image manifestations and styles. Although children are designated as "little artists," few studies have examined the images portrayed in children's drawings. Therefore, this was the research motivation of the present study.

Research Objectives

In the present study, we collected children's drawings to determine the relationship between children's drawings and the images these drawings portray. Based on the research results, we propose a conclusion and several suggestions that can serve as a reference for the parents of young children and scholars who engage in future research on this topic. Therefore, the objective of the present study was to investigate the expressive meaning of the themes portrayed in children's drawings.

Literature Review

The Meaning of Children's Drawings

The images portrayed in children's drawings are figures or shapes illustrated by children using various drawing methods. These drawings are a product of children's visual experiences, physical and mental coordination, and motor functions. In other words, drawings are a product of children's instinctive performance (Chen, 2000). The images depicted in children's drawings originate from (a) their memories of specific objects, people, animals, or environments; (b) events created purely through their imagination; and (c) observations of real-world objects in everyday life. Children consequently attempt to recreate these images through drawing (Wu, 2003).

At the initial stages of drawing, images are produced from children's body movements and motion. In other words, images are created through a series of body movements or muscle actions.

As the process of drawing continues, children begin to observe and explore the regularity of specific images, thereby establishing image characteristics. Using this set of predetermined characteristics, children begin to imitate and draw specific images. This stage of drawing is known as the “understanding pictorial signs” stage (Chen, 2000). Following this stage, children gradually acquire specific drawing skills and abilities, which they employ to create personal and unique images. At this stage, children begin to understand the meaning of images, which stimulates their desire to name or assign meanings to their drawings. At later stages, children develop sufficient skills to apply various drawing tools, and present the visual characteristics, complexity, detail, and spatial organization of their images.

Analyzing the Images in Children’s Drawings

Children typically express their conscious and subconscious desires on paper. These conscious or subconscious expressions reflect the concerns and interests of children, which are those displayed in their drawings. Yeh (1985) maintained that the feelings expressed in a child’s drawings can be determined by analyzing the theme, structure, characteristics, and color of these drawings, and comparing analysis results with the child’s everyday life events. In addition, numerous expert scholars have expressed their perspectives regarding the development and analysis of children’s drawings.

Image Themes

When drawing, children can be guided to choose distinctive themes because themes are the key to stimulating the minds of children. With the guidance and thematic suggestions provided by adults, children can express their personal experiences and perceptions of the world (Hsu et al., 1993). Yeh (1985) revealed that the themes depicted in children’s drawings primarily comprise objects and people from everyday life, such as animals, family, fictitious objects, and dreams. Drawing is a method used by children to express themselves; a method to give shape to perception. Children employ exaggerated methods or omit the most meaningful parts of an expression to express their life experiences and emotions (Lin, 2006). Dong (1995) suggested that drawings illustrated by young children sequentially follow three stages: a scribble stage, a basic shapes stage, and a preliminary drawing stage. Children between the ages of 4 and 6 years typically enter the preliminary drawing stage, where they begin to combine and name their drawings. For example, a child names a circular pattern, “puppy.” However, the manifestation of children’s drawings is often a combination of reality and imagination, rendering such drawings difficult for adults to comprehend. Therefore, analyzing the content of children’s drawings enabled us to determine the complexity and depth of a child’s mind.

Malchiodi (2003) believed that drawing enhances children’s story-telling potential. Young children are able to express meaning through figures and shapes. Art therapy practitioners can then analyze the narrative properties of children’s drawings and verbal expressions to understand children. These narrative properties are defined as “a story, a description of the past, or a type of history, statement, report, explanation, description, or record” (Wu, 2003). Moreover, instructing children to explain images by using a narrative method reduces the possibility of misinterpreting the images.

Image Features

The features of children’s drawings involve the modeling of appearances, coloring, and the use of lines during the creation process. Hsu et al. (1993) indicated that in addition to theme, the analysis of children’s drawings must include observations of shapes, colors, materials, decorations, and the beautification of the drawings. Regarding shapes, children sequentially develop from drawing dots and lines to drawing planes. This change in shape formulation requires children to

learn and master numerous drawing skills and concepts, such as expansion, balanced configuration, component, and order, to express the intended shape effectively. In addition, children typically explore spatial expressions when drawing shapes, which is a type of exercise for intersecting surfaces and controlling parallel perspectives. Regarding the expression of “skylines and horizons,” Li (1996) believed that children are able to illustrate the concept of skylines and horizons between the ages of 4 and 5 years (Wu, 2005). Children at this age also understand that the sky is located above people’s heads, the ground is below people’s feet, and air, plants, and houses are located between the sky and the ground, thus collectively establishing spatial position.

A line can be characterized as stipples, vertical lines, horizontal lines, vertical and horizontal lines, and swirls. Children between the ages of 2 and 4 years typically scribble uniform lines in the form of swirls. Children between 4 and 6 years of age are capable of combining basic shapes, such as circles, squares, and triangles, to depict images that are similar to physical objects. However, children in this age group are influenced by egocentrism, causing them to produce exaggerated drawings.

Methodology

For young children, drawing is a continuation of life experiences. Because the metacognition and language skills of young children have not yet developed, they are unable to fully comprehend the properties and content of acquired knowledge, which hinders them from using such knowledge to solve problems. Thus, children employ drawing as a medium to communicate and convey ideas.

This study examined how young children employ drawing to express thoughts and determined the meaning of image symbols by analyzing the “process” and “result” of producing a drawing. A qualitative research method was used to comprehensively understand and present the intrinsic meaning of children’s drawings and image symbols.

To achieve the aforementioned objectives, three research methods were employed: a case study, nonparticipatory observation, and document analysis. The reason for employing a case study was to collect a large quantity of data from a single or several cases. Subsequently, the data were comprehensively analyzed to obtain additional details regarding the case, gain insight into the conditions of the case in a specific situational context, and observe how the case employed drawing to express his conditions. Finally, data were collected from the case for a prolonged period to gain an understanding of the case.

To understand, care for, and guide children, one of the researchers in the present study observed and monitored the drawing activities of his own child (hereafter referred to as Child A) for a period of 5 months. The demographics of Child A were determined based on on-site observations and the qualitative analysis of Child A’s pictorial works and related data. Child A’s demographics are listed as follows: He is extraverted and kind, the only child in the family, and was 4 years and 11 months old at the time of the study. His favorite dynamic activity was playing in the park, and his favorite static activities were reading picture books and, particularly, drawing. Child A enjoyed sharing his drawings with others each time he completed a drawing.

Results

1. The Imagination and Creativity of Children Can Be Derived from the Themes of Their Drawings

Drawing is an alternative method of communication for children; that is, a nonverbal conveyance method. Drawing enables children to materialize their ideas and emotions; and it is a tool used by children to record their ideas, emotions, and experiences. In addition, drawing assists

children in verifying the differences between their sensory world and reality, and opens up a vast space in which to explore the world of the unknown or their fantasy world.

Figure 1 The Abduction of Mr. Cloud



Figure 2 The Trapped Robot



Creativity is the conveyance of mental images through imagination and the use of unique methods and forms. During art activities, children not only arbitrarily attempt to draw various shapes and models, but also enjoy the success that creativity offers (Pan, 1994). Based on Figs. 1 and 2, we observed that Child A perceived each drawing as a situation or scene from a story. The drawings potentially served to convey ideas or were a source of imaginative or creative inspiration.

2. Children Depict Life Events in the Themes of Their Drawings

Yeh (1985) argued that if the life events of children were closely observed and analyzed through the themes, structure, characteristics, and colors of their drawings, the emotions represented in children's drawings could be understood. Based on Fig. 3, we observed that Child A drew his family, which is the most intimate part of his life.

Figure 3 My Family (Father, Mother, Uncle Cheng, Aunt, and Me)



3. The Expression of Concern in the Themes of Children's Drawings

Children typically express their conscious and subconscious desires on paper, which are expressions that reflect the concerns and interests of children, and these expressions are manifested in children's drawing.

Figure 4 The House Is Collapsing



Figure 5 The Typhoon Is Coming



Child A asserted, "How terrible! The house is collapsing" and "How terrible! The typhoon is coming," when drawing Figs. 4 and 5, suggesting his inner fear and uncertainty regarding earthquakes and typhoons. The figures depict the power of the earthquake through the tilting building and the power of the typhoon through the swirling lines.

4. Children Draw What They Think Rather Than What They See in Their Drawings

Young children may draw images of what they have seen or imagined. Thus, we can deduce that children draw using their imagination rather than figures or objects they observe in real life. For example, Child A had previously watched numerous science fiction and superhero films, such as Iron Man, Transformers, The Incredible Hulk, Captain America, and Dinosaurs. Based on memory, Child A depicted scenes from the movies in his drawings.

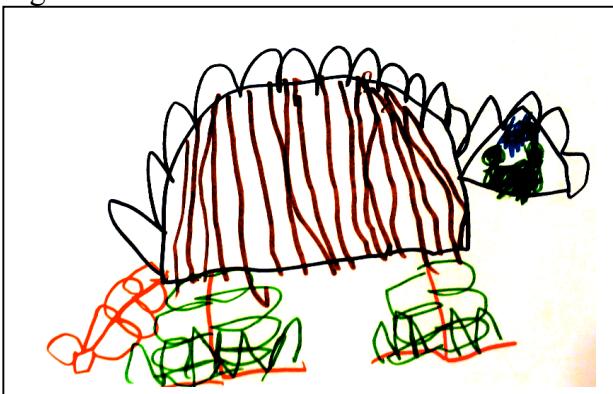
Figure 6 Iron Man



Figure 7 Bumblebee, The Hulk, and Captain America



Figure 8 The Dinosaur



Through drawing, children are able to present scenes or events that they have seen or imagined, and can clearly express the figures and objects they have depicted in their drawings.

Conclusion and Suggestions

Drawing is an alternative, nonverbal communication method for children. Drawing enables children to materialize their ideas and emotions; a tool used by children to record their perceptions, emotions, and experiences. In addition, drawing assists children in verifying the differences between their sensory world and reality, and opens up a boundless space in which they explore the unknowns or their fantasy world. Children should be encouraged to draw so that they may understand and express their feelings and comprehend that independent thinking and the freedom to be creative is respected by others. Attention should be paid toward the aspirations portrayed in a

child's drawings and children should be motivated to express their thoughts on paper or through drawing.

Children enjoy drawing life events, things that concern or interest them, particularly those that influence them. Therefore, education should begin with children's surroundings and their thoughts. Thus, patients and teachers should provide children with diverse education to enrich their experiences.

Suggestions

Parents should enhance their perspective and awareness toward their children's drawing development.

Parents should be able to understand children's drawings, and the meanings and ideas expressed in the children's image symbols to comprehensively understand their children and provide them with a suitable growth environment. We believe that parents can obtain unexpected benefits by objectively and sincerely listening to their children.

Parents should provide their children with a free drawing environment with abundant resources.

Each child has his or her unique life experiences and ideas. Parents should provide their children with an environment filled with resources to stimulate their children's inner emotions and enable them to draw happily and grow in a loving environment.

The number of research subjects should be increased.

The present study comprised one research subject: a child at the age of 4 years and 11 months. We suggest that researchers of future studies increase the number of research subjects to comprehensively understand the relationship between children's drawing performance and image symbols. In addition, children's family members, peers, and teachers can be included in the research to obtain informative results.

Interviews should be included as a research method.

The present study employed a case study as the qualitative research method. We suggest that future studies include subject interviews to determine how adults perceive and understand children's drawings. Such interviews enable objective results to be obtained, which would enhance the future reference value of the study.

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Geographic Information System for Flood Simulation in Nakhon Si Thammarat Province, Thailand

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Abstract

The aims of the present study were to create a Geographic Information System for Flood Simulation in Nakhon Si Thammarat province, and to make a map for flood risk areas in Nakhon Si Thammarat province by using Geographic Information System (GIS) with Potential Surface Analysis (PSA) and Overlay Analysis. The results showed that there are 7 factors for flooding with an appropriate weighting of each factor (Weighing). Rainfall gave the highest result (10 points), followed by the barrier to water (9.33 points), the density of water (8.33 points), altitude from sea level (6.33 points), the topography of the area (6.17 points), drainage capacity of soil (6.17 points), and finally the minimum land use and cover (5.50 points). Analysis of the flood risk areas by the weight of factors and the appropriate level of inputs given by experts found that most of the area in Mueang Nakhon Si Thammarat district has an area of moderate flood risk, which is 47.85%, followed by a high flood risk area which is 46.72% and a minimum risk flood area which accounted for 0.05% of the total area. Chai Montri, Na Khian, Mamuang Song Ton, Na Sai, Pho Sadet and Tha Rai sub-district were revealed to be the areas most prone to flooding. They had high risks of 100%, 100%, 99%, 46%, 98%, 78%, 95%, 88%, and 92.28% of the total area, respectively.

Keywords: Geographic Information System, Flood, Risk Areas

Introduction

Thailand is a country at risk of frequent natural disaster, which can cause damage to both people and property. Storms, floods, drought, mudslides and earthquakes all occur in Thailand on a fairly regular basis. The South of the country is an area that is particularly at risk of mudslides, floods and storms, which are the major causes of flooding in Thailand because of the tropical climate and geography.

Mueang district is a major city in Nakhon Si Thammarat, southern Thailand with the coordinates 8° 25' 12" North, 99° 57' 48" East. It has an area of about 591.531 km². There are 13 sub-districts, 4 municipals, 114 villages and a population of 267,021. The Mueang district area is a plain that is located between the East of Nakhon Si Thammarat mountain range to the coastal area of the Thai gulf. It has upstream rivers from the mountains, which flow down to gulf of Thailand. The soil is fertile and is good for growing crops. Most of the area grows rice, rubber trees and fruit trees. This plain is important to the city and is an economic center of the province.

Mueang city has a tropical rain forest climate with average temperatures of 27.58°C, Mueang district has 2 seasons which are the hot, dry summer and the rainy (monsoon) season. The area has an average rainfall of 2,620 mm per year. When it rains, rain water from the West of the Mueang district flows to the center of the city where people live and, which are center of the economy of the city. The water flow causes floods nearly every year making it hard to grow crops consistently. From these problems, the study will consider the areas most at risk to flooding each year in the Mueang district. Then, what needs to be studied further to alleviate flooding by co-operating with GIS to define where the areas most at risk from flooding are. The results can be used to improve flood prevention systems in the future.



Fig 1.1



Fig 1.2



Fig 1.3



Fig 1.4



Fig 1.5



Fig 1.6

Figure 1.1-1.6: Flooding in Mueang District, Nakhon Si Thammarat Province in 2011. These pictures are from various sub-districts within the district that were particularly affected.

RESEARCH OBJECTIVES

1. Develop a Geographic Information System for Flood Simulation in Nakhon Si Thammarat Province.
2. Build map flood-risk areas of Nakhon Si Thammarat Province.

Methodology and Materials

This study focuses primarily on Mueang district, Nakhon Si Thammarat province. It applied Geographic Information System (GIS) with spatial analysis (PSA) and the results of the analysis are shown on the map (Fig.2.1). Designing and developing databases used various sources, including dominant place and the location of villages, traffic/transport, soil, drainage, land use, and watershed sub-basin boundaries, meteorology data, rivers and sources of water, the location and extent of irrigation projects, altitude from sea level, slope and the location of government/private departments and offices.

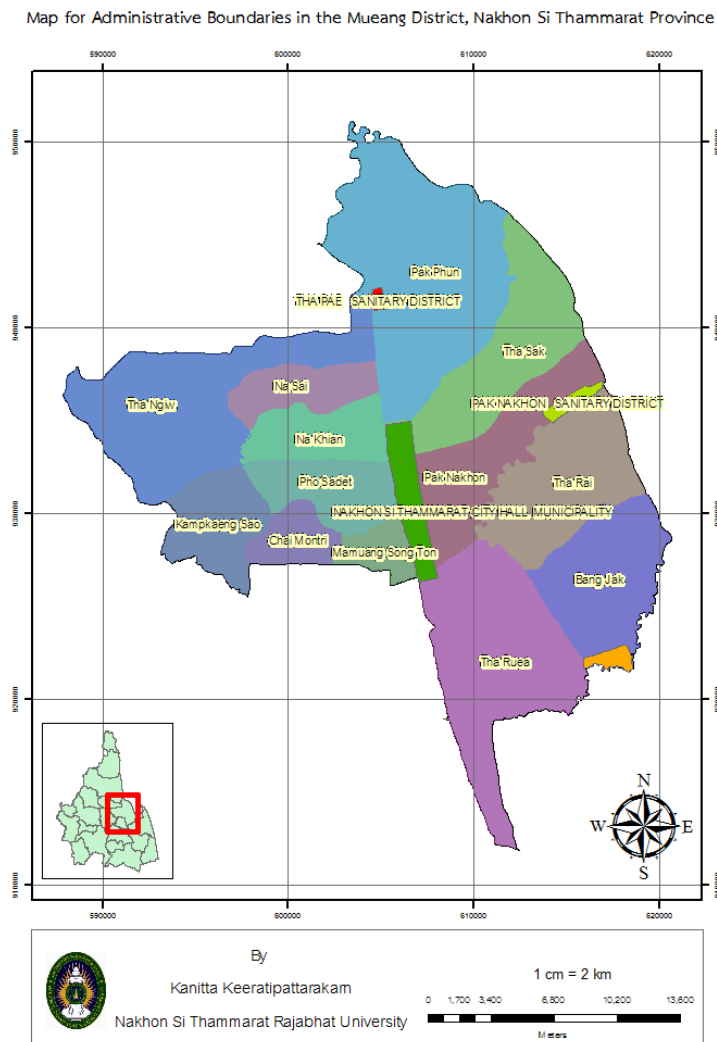


Figure 2.1: Administrative Boundaries in the Mueang District, Nakhon Si Thammarat Province.

Results

Factors that affect or cause flooding are as follows; rainfall, altitude above sea level, the topography of the area, the density of water, soil drainage, land use and the barriers to water. The evaluation of the appropriateness of the weight factor and the suitable scores from experts are shown in tables 1 and 2.

Table 1: Weight scores for each factor in analysis

Factor	Weight Scores
1. Rainfall (W_1)	10.00
2. Barrier to water (W_2)	9.33
3. Density of water (W_3)	8.33
4. Altitude above sea level (W_4)	6.33
5. Slope (W_5)	6.17
6. Soil drainage (W_6)	6.17
7. Land use (W_7)	5.50

Table 2: Suitability scores for each factor in analysis

1. Rainfall (R_1)	Suitable Scores
Class 1 > 100 mm.	9.83
Class 2 76 – 100 mm.	6.67
Class 3 61 – 75 mm.	4.67
Class 4 0 – 60 mm.	2.17
2 Barrier to water (R_2)	
Class 1 0.000000 – 0.001540 km../km. ²	3.67
Class 2 0.001541 – 0.002249 km../km. ²	6.00
Class 3 0.002250 – 0.003906 km../km. ²	7.00
Class 4 0.003907 – 0.005672 km../km. ²	8.17
3. Density of water (R_3)	
Class 1 0.009621 - 0.350000 km../km.2	5.17
Class 2 0.350001 - 0.700000 km../km.2	5.33
Class 3 0.7000001- 1.000000 km../km.2	5.33
Class 4 1.000001 - 1.326256 km../km.2	6.00
4. Altitude from sea level (R_4)	
Class 1 20 – 100 Meters. Above sea level	7.17
Class 2 101 – 300 Meters. Above sea level	5.00
Class 3 301 – 500 Meters. Above sea level	3.83
Class 4 > 500 Meters. Above sea level	3.17

Table 2: (continued)

5. Slope (R₅)		
Class 1	0 – 5 %	7.17
Class 2	6 – 10 %	5.17
Class 3	11 – 15 %	3.33
Class 4	> 15 %	2.00
6. Soil drainage (R₆)		
Class 1	Poor drainage	6.67
Class 2	Relatively poor drainage	5.00
Class 3	Moderately well drained	3.67
Class 4	Good drainage	2.33
7. Land use (R₇)		
Class 1	Residential areas	6.83
Class 2	Rice / crops	4.67
Class 3	Space for other uses	6.00
Class 4	Horticulture / perennial	3.67

The following maps are the results of our data input; they are classified by four classes respectively. The rainfall map is the only one without the classification as it is not possible to classify rainfall data in this way. The results are shown below.

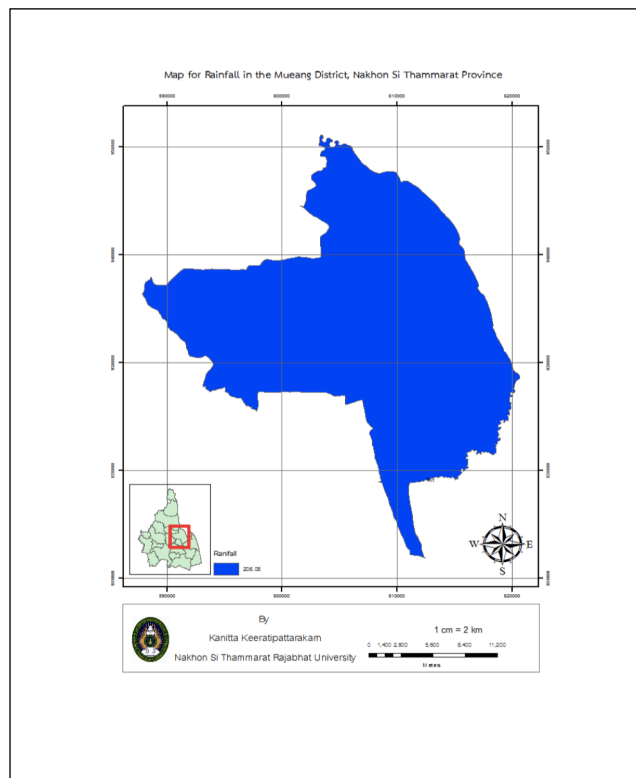


Fig 3.1: Average of the maximum daily rainfall per month in Nakhon Si Thammarat province.

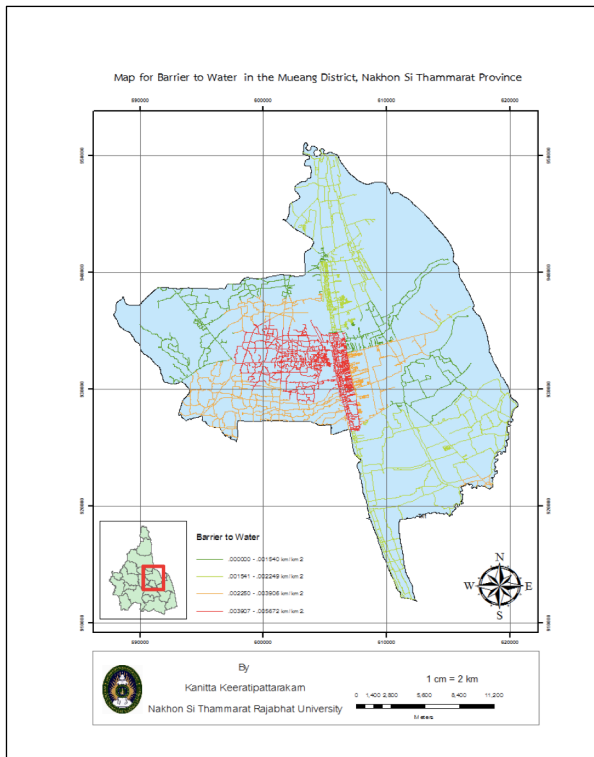


Fig 3.2: Barriers to water.

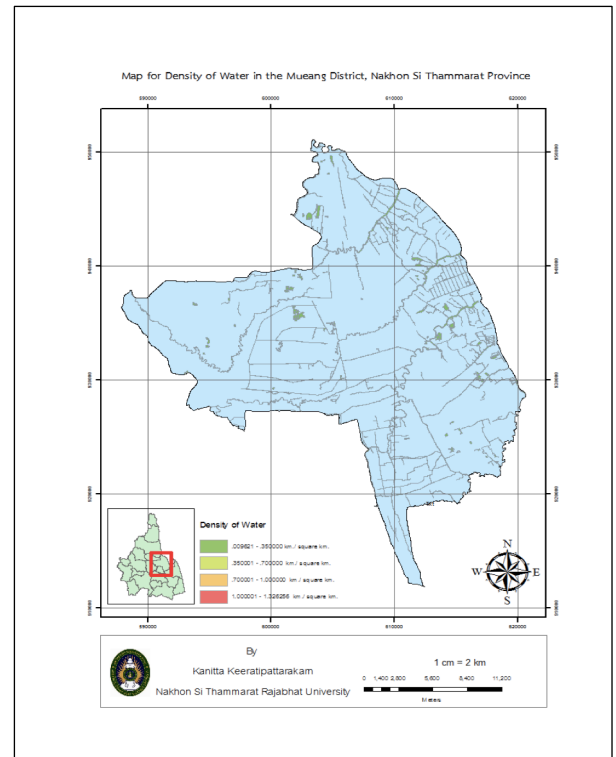


Fig 3.3: Density of water

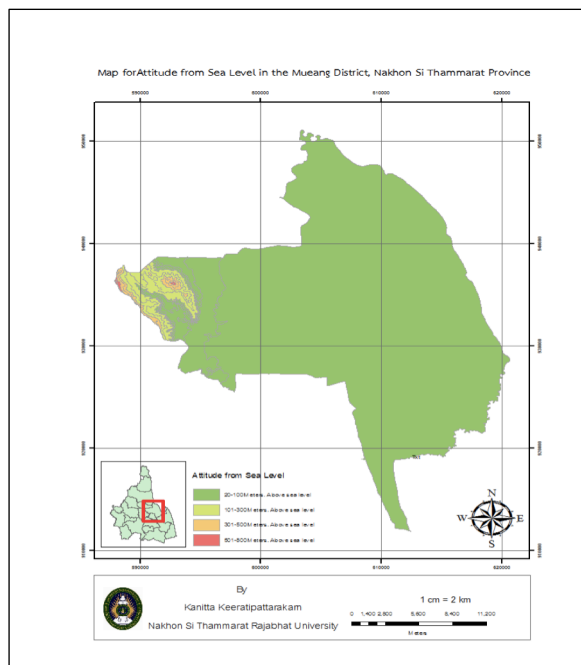


Fig 3.4: Altitude from sea level

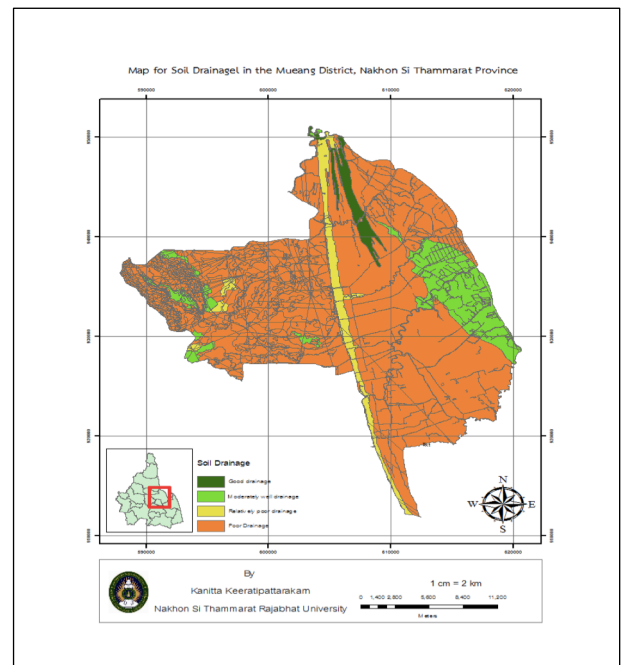


Fig 3.5: Soil drainage

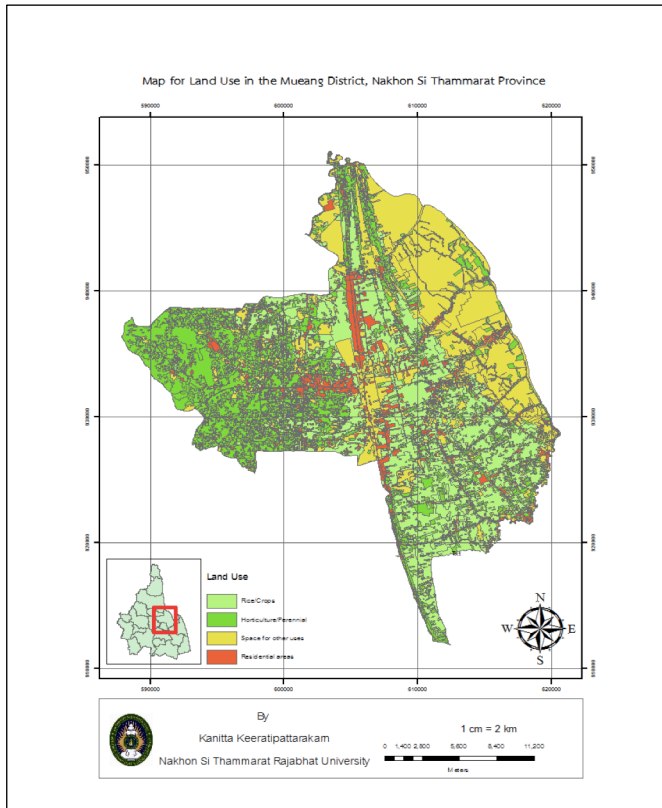


Fig 3.6: Land use

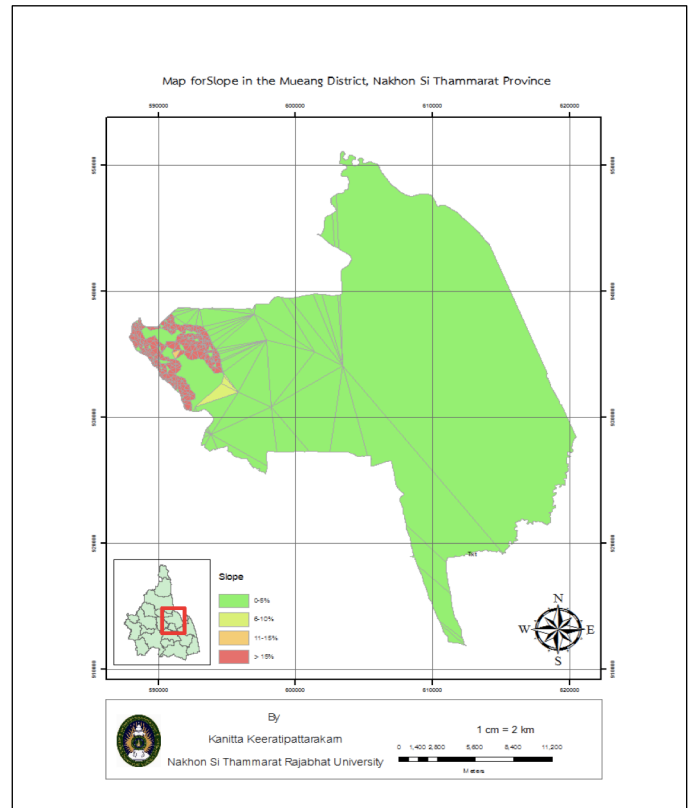


Fig 3.7: Slope of land (topography)

Figure 3.1 – 3.7: GIS maps for factors causing flooding in the Mueang District, Nakhon Si Thammarat Province.

The relevant factors were input into GIS to analyze flood risk areas using the overlay technique from the total score risk area equation (S)

$$S = R_1W_1 + R_2W_2 + R_3W_3 + R_4W_4 + R_5W_5 + R_6W_6 + R_7W_7$$

When R_i is the suitability score i^{th} ($i = 1, 2, 3, 4$) and W_i is the weight score i^{th} ($i = 1, 2, \dots, 7$)

So that

$$S = 10.0R_1 + 9.33R_2 + 8.33R_3 + 6.33R_4 + 6.17R_5 + 6.17R_6 + 5.50R_7$$

The 7 main factors that affect flooding in the Mueang District, Nakhon Si Thammarat include rainfall (average maximum daily rainfall per month), altitude above sea level, topography of the area, the density of water, soil drainage, land use (land cover) and barriers to

water. Evaluation weight and scores of inputs from experts found that rainfall was a factor that caused the flooding to peak (10 points), followed by barriers to water (9.33 points) and last was land use (5.50 points).

The analysis of the flood risks from the equation S, by risk score classification into different levels of natural breaks were as follows.

No Flood Risk Area	Interval scores	272.58 – 314.22
Low Flood Risk Area	Interval Scores	314.23 – 339.81
Moderate Flood Risk Area	Interval Scores	339.82 – 361.12
High Flood Risk Area	Interval Scores	361.13 – 385.94

Flood risk areas as follows in table 3

Table 3: Flood risk areas in the Mueang District, Nakhon Si Thammarat.

Level of Risk	Area (km²)	Percent
No Flood Risk Area	0.28	0.05
Low Flood Risk Area	28.47	5.38
Moderate Flood Risk Area	252.94	47.85
High Flood Risk Area	246.96	46.72
Total	528.64	100.00

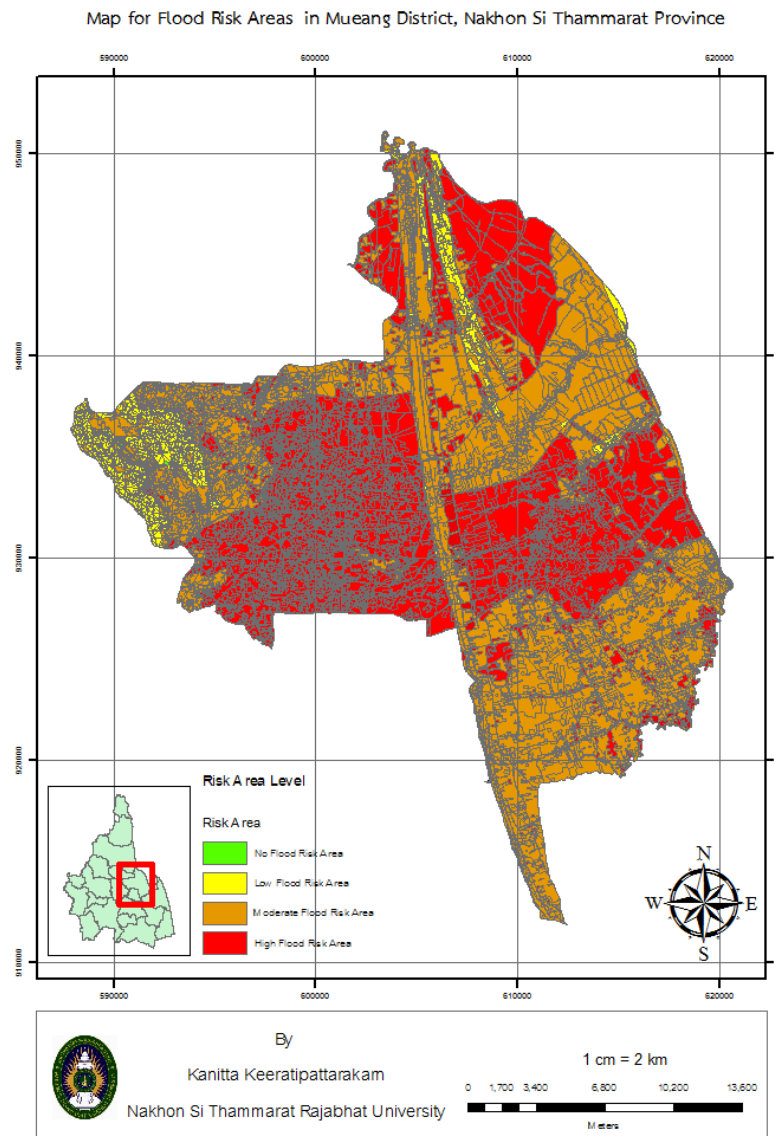


Figure 4.1: Map showing flood risk areas in the Mueang District, Nakhon Si Thammarat Province.

The Mueang district has a moderate risk of flooding which is at 47.8%. This is almost equal to the high flood risk area, which is 46.72%. The lowest flood risk area is only 0.05% of the total area. Of the classified study areas, there are 2 sections, which are the areas in the municipals and outside of the municipals. The study found that the Nakhon Si Thammarat, Tha Pae and Bang Jak municipal areas in the Mueang district, were at moderate risk of flooding at 67.20%, 61.33% and 57.05%, respectively, but Pak Nakhon municipal has the highest proportion

of low flood risk areas at 35.13%. Every municipal has a minority of non-flood risk areas. Outside of the municipals, the areas that are the highest flood risk areas are Chai Montri, Na Kien, Mamuang Song Ton, Na Sai, Pho Sadet, Tha Rai, Kampang Saw and Pak Nakhon sub-districts. These were 100.00%, 100.00%, 99.46%, 98.78%, 95.88%, 92.28%, 87.06% and 74.69%, respectively. Tha Sak, Tha Rue, Bang Jak and Tha Ngiw sub-districts are mostly moderate flood risk areas at 96.74%, 90.01%, 84.90% and 64.64%, respectively.

Discussion

Assessment of the weighting scores and suitability scores for each factor found that rainfall is a meteorological factor causing flood peaks. The results were consistent with the results of reseach of Nathnares Arekonsuwan (2008), who studied flooding to determine flood risk areas using GIS and preventative relief in the Songkhla Lake sub-basin, Phatthalung province. It found that rainfall was the main factor, which also corresponded to the quotient by Chow Wongchalerm (2004), who studied the areas with a chance of flooding using satellite data and GIS in Chumphon, Surat Thani and Nakhon Si Thammarat provinces. He found that rainfall was the main factor there as well. However, this does not comply with the research of Supichar Thanarun (2009), who studied the application of GIS to determine flood risk areas in Ang Tong province and found that the barrier to water was the most important factor affecting the occurrence of flooding. This study was also inconsistent with the study of Kobkit Krinara (2006), who studied the areas vulnerable to flooding in the Phetchaburi water-basin, Phetchaburi Province and found that land use was the main factor affecting flooding in the region.

This analysis found that moderate flood risk areas and high flood risk areas had the highest proportion with similar or equivalent to 47.85% and representing 46.72% of the total area. This was not consistent with the study by Prasit Makarun (2001), who studied the application of GIS and the potential for flooding in the Yom basin, Northern Thailand, which found that most of the southern areas of the Yom basin had moderate flood risk areas accounting for 35.22% of the area.

This study is also inconsistent with the findings of Supichar Thanarun (2009), who studied the application of GIS to determine flood risk areas in Angtong province, and found that most areas had a high flood risk, 99.23%, and that moderate flood risk areas accounted for the remaining 0.77% of the total area.

Conclusion

Roads and waterways should be improved by building more storm drains. This will allow rainwater to flow more freely during periods of heavy rain. As we can see from figure 5.2 current storm drains are not placed in the correct area of the road. They should be on either side of the road so as to aid the flow of water. From this photo we can see that the houses have been built to close to the road and are especially prone to flooding because of the poor drainage systems in place. In figure 5.1 we can see a long stretch of road and adjoining waterway, which has only

one storm drain to allow the flow of rainwater underneath the road. This causes flooding in the area as the rainwater cannot flow through the drain and under the road in sufficient amounts. This problem can be solved by inserting more drains underneath the roads to allow more free flowing water. Furthermore, in areas which are of less economic value to the region, there should be designated flood plains, which will become flooded during times of high rainfall to alleviate flooding in more populated areas. In figures 5.3 and 5.4 we can see how the same road (as in fig 5.1) and adjacent railway track is obstructing the flow of water from one area to another area which could be used as a designated flood plain during times of high rainfall.



Fig 5.1



Fig 5.2



Fig. 5.3



Fig. 5.4

There should also be a designated area for a dam and water catchment areas to alleviate flooding in the area, these can also be used for water consumption in the dry season, which the district is currently experiencing. There is not enough water for domestic use in many households and establishments in the city which impacts on the economy of the province. We can see in figures 5.5 and 5.6 that the current waterways in the province are poorly maintained, which leads to more obstructions and therefore less chance of water flowing freely during

periods of high rainfall. If there was more maintenance of these smaller waterways then the problem of obstructions to the free flow of water would be eased. However, it is difficult to improve the condition of these waterways as there has been lots of construction in the vicinity of the waterways which has led to the waterways becoming narrower and therefore less able to aid the flow of rain water.



Fig. 5.5



Fig. 5.6



Fig. 5.7



Fig. 5.8



Fig. 5.9



Fig. 5.10



Fig. 5.11



Fig. 5.12

Moreover, if we analyze figures 6.1 and 6.2 we can see how the problem of water storage impacts upon the city's public water supply. From fig. 6.3 we can see how the level of water has dropped dramatically and figure 6.4 shows the waterway's only dam to serve which isn't sufficient enough to ease the problem of water storage in the province. There should be more small dams built in suitable places to help store water during the monsoon season for use during the dry season. (Figures 6.5 and 6.6 show the water pumping system used for pumping public water).



Fig. 6.1



Fig. 6.2



Fig. 6.3



Fig. 6.4



Fig. 6.5



Fig. 6.6

It is hoped that this study will be of use for educating university students on this topic. The Geographic Information System used for this research should be utilized by students for their own studies on this topic. It is hoped this research will be of benefit to those who wish to use it in any future research.

Acknowledgement

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The Role of a Gender-Based History-Writing of Education in the Preparation for Social and Civic Competence

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Abstract

Out of the eight key competences that have been accepted by the European Union in 2006 one is social and civic competence, which is an individuals' ability to participate actively in the formation of society and to organize the macro- and micro-society in their immediate surroundings. A significant aspect of civics is history, and within that, the results of the history of education, which show and stress the individual's active social involvement based on the accomplishments of the past. But one should not forget those social groups, which – for various reasons – have been left out of the history-writing of education, such as women, Roma people, and individuals living with disabilities. A history writing of education based on gender takes these marginalized groups into consideration on the one hand, while on the other, it also problematizes the process by which exclusion happens.

In my paper – primarily relying on the English sources of a gender-based history-writing of education – with the aid of content analysis, I explore the ways in which gender appears in Hungarian history-writing of education, how the various authors discuss the histories of different social groups and the kind of “alternative” histories that are created.

A gender-based, history-writing of education can contribute to raising people's awareness to the fact, that gender roles are socially constructed, that one's rigid and fixed expectations towards gender roles narrow their prospects (and not only in education), and define their lives. An equitable education would mean that everyone, regardless of their social definiteness, has access to resources without limitations, and everyone can actively participate in the life of society; and in order to do so, they would receive sufficient and appropriate examples during their time spent in educational institutions.

Key words: gender, history, social competence, education

Background

Nowadays practically every EU level policy acknowledges the importance of supporting active democratic citizenship (Eurydice, 2012). One of the aims of the European Council in Lisbon in 2000 was to create a European framework system, which could define for every individual the new basic skills based on lifelong learning in a knowledge-based society. The Lisbon Strategy emphasized the importance of key competences owned by the individual in establishing social cohesion, economic development, competitiveness and welfare. (Hoskins et al., 2008., Halász-Michel, 2011) It is also due to the Lisbon Strategy that the concept of active citizenship entered the vocabulary of EU documents and policies. Within the frame of the Strategy active citizenship meant that the individual is prepared to make their voice heard in the community, and that they are able to interpret the relationship between the individual and the community, understand the different cultures and opinions and accept equality and democracy as values. Later, the original definition was followed by a number of different interpretations coming from various points of view, in which rights and responsibilities were primarily emphasized, which was later supplemented with the concept of participatory democracy. (Hoskins et al., 2008)

The Education and Training 2010 strategic frame program, which was accepted as part of the Lisbon Strategy, proposed three aims: improving the quality and efficiency of educational and training systems, provide accessibility to every individual, and make education accessible in the whole world. The requirement that accessibility should be provided includes active civil existence, supporting equal opportunities and social cohesion, in which the individual learns how to participate actively and responsibly in the society that surrounds him or her, and how to support minority groups in practicing their rights and making their points of view visible. The frame program – not only in this area – thinks of education and training as a strategic field. In this interpretation, education and training can be understood as a tool in the hands of society, by which society can be formed, so for example, the individual can learn that discrimination based on any identity component (skin colour, gender etc.) is not an acceptable social practice.

The Education and Training 2020 strategic framework reinforces in its aims the importance of the so-called cross-curriculum competences: lifelong learning and mobility, social cohesion and active citizenship, creativity, innovation and supporting enterprises. (Halász-Michel, 2011) One of its aims is “promoting fairness, social cohesion and active civic involvement”, in which the role of education and training is to enable every citizen to “acquire, update and develop skills and competences required for employability, and it should also facilitate further learning, active civil involvement and creating a dialogue between cultures.”¹

¹ Council Conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training (ET 2020) [Official Journal C 119 of 28.5.2009].

Strategic Objectives:

1. making lifelong learning and mobility a reality
2. improving the quality and efficiency of education and training
3. promoting equity, social cohesion and active citizenship
4. enhancing creativity and innovation, including entrepreneurship, at all levels of education and training

Thinking about competences necessary for a knowledge-based society had already started in the 1990s in the activities of international organizations dealing with education. The OECD emphasized on many forums and in studies that redefining the content of education is necessary in order to allow every citizen to learn the basics required for prosperity in a 21st century society. These were mostly proposed in the form of new knowledge, competences and values. The need rightfully emerged for proposing general skills, whose basic knowledge can help the individual participate effectively and successfully in a knowledge-based society, and so help society itself run successfully. In the 2000s, OECD started the PISA tests in which they measured in 15-year-olds how well they acquired the competences necessary for their later lives, successful employment and active citizenship. During the tests they measured both those skills learned within and those learned outside the school system in real-life situations (Halász-Michel, 2011) and sought answers to the question of what kind of qualities and knowledge does a young person need nowadays in order to operate effectively in society. In other words, education and learning must prepare young people to enable them to motivate and manage their own learning throughout their lives. (Kerr, 2008)

The 2006 recommendation of the European Parliament and the European Council on the common European reference framework for the key competences² – based on the context of the time – proposed eight key competences which ensure that the individual is capable of adapting to continuous changes, and which everyone needs for self-realization, development, active citizenship, social inclusion and employment. That is, the key competences might be the means to prosper in a knowledge-based society, and their acquisition – according to the recommendation – is primarily connected to formal education. One of the eight key competences is social and civic competence, from which social competence is the one that really focuses on the issues in my present study. According to the document: „Social competence refers to personal, interpersonal and intercultural competence and all forms of behaviour that equip individuals to participate in an effective and constructive way in social and working life. It is connected to personal and social well-being. An understanding of codes of conduct and customs in the different environments in which individuals operate is essential. Civic competence, and particularly knowledge of social and political concepts and structures (democracy, justice, equality, citizenship and civil rights), equips individuals to engage in democratic participation actively in the society. This includes for example that the individual thinks about equality between the genders in a responsible manner, knows about the relationship between individuals and society, knows about and understands the multicultural and social-economic dimensions of European societies. It also includes the individual's ability to communicate effectively in different environments. Furthermore, they are tolerant, they accept and understand the various points of view, they are empathetic and sympathetic. All of the above can only be realized if the individual respects diversity, respects others, and is prepared to fight prejudice. Civic competence includes the individual's effective cooperation with others and their solidarity regarding the problems of the community that surrounds them. This would be inconceivable without the individual's acceptance of equity as a value and without their respect for different social groups. Active participation means that

² For the conceptual definition of competences and key competences see: Halász-Michel, 2011.

the individual supports social diversity, cohesion and sustainable development, and respects the private life and values of others.

It is clear that since the 2000s, education and training has been more and more conceived as a strategic field in the documents of the Union and OECD, in the recommendations and in the policies. This means a kind of education and training which satisfies the current needs of the individual and the society; one which is fair, which means that it provides access to everyone, and offers extra support to those social groups, who, due to some disadvantages, would otherwise be excluded from it. Education is positively connected with the construction and maintenance of active citizenship competences and that higher education has the greatest effect. (Hoskins et al., 2008) As the previously mentioned EU documents propose, the literature also stresses that education is a strategic tool and area in a democratic society and in creating social cohesion, and as part of it, in training young people to become active citizens. The most efficient form of learning about participating as active citizens is the so called situational learning/learning embedded in a situation/understanding connected to a situation/situated learning, in which we create a learning environment that is most appropriate for the context (for example volunteerism). (Hoskins et al., 2012a)

One of the elements of creating knowledge which is the basis of critical active citizenship is realizing the components that exclusion from society is based on, and how exclusion happens. This is possible if students come into contact with stories about minority groups from the point of view of the minority groups themselves during formal education. The most recent research of Korostelina (2013) investigates the role history-writing has on identity formation, how it can help mitigate conflicts and – with the constant revision of the curriculum – how it can create the culture of peace.

Learning history and getting to know the histories of different social groups is a tool that can change the dynamics of identity-based conflicts, it can reduce negative perception, and facilitate an understanding between different or even opposing groups. When teaching history there is a possibility to question stereotypes and prejudices with the aid of different stories, as well as to come up with alternative interpretations and to represent multi-perspective points of view. This means that learning history plays a key role in forming social identity. Teaching history supports social cohesion on the one hand, with the curriculum, which can help us understand which social groups were excluded from the current group identity and the reason behind it, and on the other hand, it can contribute to the reformation of identities. History books which connect contemporary events, policies and decisions with events of the past operate as similar tools, and with the aid of this technique they can problematize concepts such as equality, or human rights. For this very reason, history teaching – based on examples – instead of stressing differences and opposition is capable of presenting diversity as a value, which relies on tolerance, solidarity and collective welfare and prosperity. The discussed examples and historical narratives support critical thinking, reflexion on identity, power and dominant positions as well as the core principles of mutuality and cooperation. (Korostelina, 2013)

In order to make the histories of different minorities and social groups that have been left out of mainstream history-narratives accessible in formal education the primary necessity is to know the histories of these groups and the fact that historiography should talk about these narratives. One of the subareas of a history writing which integrates gender is the history-writing of education, in which researchers primarily seek answers to the questions of

how the histories of women can be made visible for the history-writing of education, how they became the shapers of their own educational opportunities, and why or how they were subjected to multiple disadvantages in education even during the 20th century. In these histories women are not understood as a homogeneous category but, in addition to the gender aspect, they are understood along the lines of other identity components such as social background, ethnicity etc. One of the questions in my study is how much this criteria, these questions and these problem areas are present in the history-writing of education in contemporary Hungary. Who writes these histories and of whom are these histories written? Based on my initial suggestions, even though there are women in the history-writing of education, these researches rather “add” women’s histories to already existing ones.

One of the most frequent questions regarding the analysis of gender is how much difference can there be between gender history and women’s history. An excellent researcher of the history of education and cultural history, Ruth Watts (2005), when analyzing the 1976-2004 issues of *History of Education*³, a well-established scientific journal, pointed out that the categories of “gender” and “gender studies” are used in a considerably lax manner and often as a synonym for “women”.⁴ One of the primary reasons for this is that the border between the two is so faded that they are hard to distinguish. (Watts, 2005) Research of the last two hundred years clearly stresses the significance of gender as an analysis category. The real question is whether the increasing visibility of the gender issue contributed to changing gender-interpretations and whether it had an effect on the whole area of knowledge.⁵ It is primarily characteristic of English-speaking areas that in addition to the effect of feminist and gender history we can clearly establish the effect of postcolonial theories on the history-writing of education, culture and andragogy. (Goodman – Martin, 2005)⁶ The effects of these theories can be observed in the continuously renewable methodology and in the choice of topics as well. Stressing interdisciplinarity, it problematizes the visibility of women, the relationship between gender and power, the connection between work and gender, the social constructedness of sexuality, the dichotomy of the public and private spheres, and the study of family, social background, and different social networks. (Watts, 2005)

Gendered Papers on History of Education in Hungarian Pedagogical Journals

In my research I analyse the four decisive Hungarian journals of the field of education, concentrating on the time period after 2004. One can rightfully ask what changes were made in the Hungarian history-writing of education in the decade since Hungary joined the European Union and what problem areas became foregrounded. My main enquiry is whether women appear at all, if they are visible as active agents, as narrators or shapers of stories. Are

³ See the list of studies in: Watts, 2005b.

⁴ Goodman and Martin also analyse the articles of the *History of Education* between 1972 and 2004 with special regard to debates, topics and methodologies. They ask how much historians were capable of surpassing established academic borders. Goodman – Martin, 2004.

⁵ In her analysis Watts highlights the fact that it is not important whether in a quantified manner there were more articles published in the *History of Education* about women or by women, because this would only be a simplified quantitative indicator. She specifically calls attention to the fact that there are articles which are about women but do not discuss gender issues. Watts, 2005.

⁶ On the connection between the theories and feminist view points, primarily based on the approach of Margaret MacLure see: Goodman, 2003.

there histories about women? Upon further consideration of the issue, it is worth considering how much we can discuss women as a homogeneous group and how much other identity components define how we talk about women. As quantifying the published material is not sufficient; it is also necessary to investigate whether the possibly quantifiably larger visibility necessarily means the appearance of gender-based interpretations in the field, and whether it means gender consciousness. In other words, does the greater number impact the field itself? (Watts, 2005)

The attention of Hungarian history-writing of education, culture and andragogy has turned more specifically and more strongly towards gender as an analysis category in the past few years. We can consider it a positive change that there are more and more studies and conferences where we hear about research where the point of view of gender analysis was also 'used'. However, it is also clear that there are still specific conferences organized around the topic of gender and journals still dedicate special issues to the topic. It is a much rarer phenomenon that the analysis point of view of gender is an integrated part of conferences and journals of the history-writing of andragogy, education and culture. This, on the one hand, means that gender is included in the discourse of Hungarian history-writing of education, culture and andragogy, but on the other hand, one might ask in what form is it included. The question is, when gender is considered, do researchers reflect on the theoretical framework and methodology behind it or are these writings strictly about women?

To gain a deeper understanding of the issue I indicated the exact percentage of works published in journals dedicated to education which deal with the history-writing of education, and how many of those focus specifically on women or the two genders.⁷ I followed the methodology and steps of Watts (2005), the president of the History of Education Society at the time, who analysed from a gender point of view the articles published in the *History of Education* journal between 1976 and 2004. Her main question was how many articles were written in this period about the history of genders, about women, and whether the larger quantity of published articles meant a change or broadening of the field of history-writing of education. Watts found 87 studies published in the 28 year interval that were about the education of women and/or used a gender-based analysis.⁸ Apart from quantifying, Watts did a qualitative content analysis as well. She pointed out that there was not only a change in the content in this period, but that the diversification of the research focus also brought theoretical and methodological reflections as well. Based on this, one can conclude that if one wants to research the histories of social groups that have been excluded from the mainstream history-writing of education, one needs to change their methodology as well. Due to the historical legacy of colonization, the post-colonial approach is markedly present in the *History of Education* journal along with post-structuralism. She specified minorities, geographical links and masculinity researches as areas of shortage (Watts, 2005).

As a necessity, I understood women as a homogeneous category in this research, but it is important to note that the concept of intersectionality points out the very fact that the various identity components (gender, social class, ethnicity etc.) cannot be understood alone, because they are in constant interaction with each other, creating different inequalities. (Vincze, 2012., Sebestyén, 2014)

⁷ The title or the text itself should include the word „women”.

⁸ This is due to the fact that Watts (2005) examined a journal that specifically deals with the history of education.

JOURNAL	Educational Sciences	History of education	About women
Magyar Pedagógia	155	26	3
Iskolakultúra	1151	186	11
Új Pedagógiai Szemle	982	83	2
Educatio	462	48	6
TOTAL	2750	344	22

Hungarian Educational journals 2004-2013

From between 2004 and 2013, 2750 works were examined in the research, out of which 344, that is, 12% dealt with the history of education or had a history-writing of education focus. It can be concluded that the works on the history of education have a Hungarian focus and that we can rarely find works that analyse a period or issue of a broadly understood Europe; not to mention territories outside of Europe. This phenomenon might be due to the fact that the analysed journals are in Hungarian and are optimized to the Hungarian readership.⁹ Regarding the international promotion of the Hungarian results Benő Csapó emphasizes: “From the point of view of the tasks of Magyar Pedagógia, the most important question that continuously needs to be reconsidered and reinterpreted is the connection between the internationality of science and the Hungarian publications. (...) Being a member of the European Union and the creation of a European research space makes the international integration of the Hungarian history of education research inevitable.” (Csapó, 2005. 6.) Due to the particular situation of pedagogy the author explains that – even though there is a growing need for publication in foreign languages – the use of the national language is understandable since the research results are read not only by researchers but by teachers in training and occasionally by parents as well.

Based on the research, it can be concluded that gender does not appear in the history-writing of education: the works only occasionally reflect on the hierarchies and inequalities that arise from the interaction of the various identity components. This might be due to the fact that the English-speaking feminist/gender-based tradition of history-writing of education did not become established in Hungary.¹⁰ That is, the works are not about women, their points of view, fights and neither are their notions represented. During the analysis I do not consider the general history of education articles apart from quantifying them, but primarily concentrate on those that focus on the history of women's education. However – due to the interpretative nature of qualitative content analysis – I address topics that require special attention in accordance with the categories of the research even though they do not specifically focus on gender (such as territories outside of Europe, the histories of Roma people and teaching the holocaust).

Magyar Pedagógia (Hungarian Pedagogy) is the scholarly journal of the Pedagogical Committee of the Hungarian Academy of Sciences. In the examined interval, 17%, that is, 26 studies were categorized as having a (broadly understood) theme of the history of education. I

⁹ Occasionally there are works in Magyar Pedagógia (Hungarian Pedagogy) which are written in a foreign language.

¹⁰ Katalin Kéri pointed this out to us at the National Pedagogy Conference in 2011. Unravelling the reasons for this would require more inquiries, which go beyond the limits of this study.

found three works that, even though they do not specifically deal with the education of women, consider the different opportunities and roles of the two genders. The journal entitled *Iskolakultúra* (School-culture) was created after the change of regime in Hungary, with the primary aim of disseminating professional and scholarly knowledge¹¹. The proportion of works with a history of education theme is 16%, out of which 11 focus specifically on women, or present – and possibly centralize – the points of view of women in the analysis. It is also due to the orientation of *Iskolakultúra* that there is a relatively high number of works discussing territories outside of Europe, the history of childhood or works focusing on the theoretical and practical issues of history-writing. *Iskolakultúra* – due to its strong interdisciplinary nature – publishes a higher number of studies and articles on the history of literature, philosophy and even natural sciences. The 11 discussed works make up 6% of the studies that have a history of education focus, but gender does not appear in them. There are 47 articles regarding the history of education in *Educatio*, another interdisciplinary journal, of which there are 6 in which issues are discussed based on gender-differentiation, or discuss specifically women's issues. Out of the 83 studies that appeared in *Új Pedagógiai Szemle* (New Pedagogical Review) which discuss the history of education or history-writing, only 2 focus on the history of women's education.

Conclusion

One can justifiably ask how preparing people for social and civic competences can be realized if there are hardly any scholarly works on the history of women's education in history-writing. It is important primarily because women, as one of the largest minority groups, are (also) present in the history of education. However, one has little knowledge of their roles and voices not only in the Hungarian but also in the international arena. This lack of knowledge was changed by the growing number of researches on the history of women's education, which can be closely connected to the increasing number of researches on the history of women in general.

As Joan Wallach Scott (1986) pointed out in her ground-breaking study on historiography, when analysing gender one needs a theoretical framework, otherwise the great number of good quality historical works are in vain. Even though more and more researches are based on the results of gender studies, or rather, there are more that integrate the analysis category of gender, one can rarely find works either regarding the definition of gender or – based on international literature – works that sketch the related theoretical and methodological frame in the Hungarian literature. And in works on the Hungarian history of women's education these cannot be found at all.

Obviously, there is no direct connection between new developments in a field of science and the integration of these developments into its school curriculum. Yet we still think that if the focus of scholarly works ignore minority groups, for example talks of education and training in a general way, the defining parts of the history of society will remain invisible. Based on my analysis I conclude that the history of women's education is still on the periphery in the Hungarian history-writing of education and they rather add stories to the

11 Géczi says the following: „between the scholarly and disseminating journals, it takes on the task of maintaining the communication between educators and highly qualified pedagogical professionals” (Géczi, 2005. 24.)

mainstream histories of education instead of integrating and building on gender theories and methodologies.

Social and civic competence presupposes that the individual can think responsibly about the inequalities between the genders, about the relationship between the individual and society and knows and understands the multicultural and social-economic dimensions of European societies, understands and accepts the various points of view. It is the task of history-writers of education and members of the academy to – supposing that they themselves are sensitive to social issues – make the histories of marginal groups visible and continuously question the problem areas and boundaries of mainstream history-writing of education.

One might ask what social effects do those histories of women's education might have that, even though they are about women, they do not discuss repressive gender structures and do not critically interpret the dynamics of inclusion-exclusion which are realized in the field of education and training. Without a critical interpretation the very thing that could contribute to sensitizing and could strengthen the key competences of those who participate in lifelong/lifewide learning will remain invisible: questioning dominant ideologies and standing up to injustice against themselves and other social groups.

The research of Korostelina (2013) shows that learning history and getting to know different histories are especially important in learning social and civic competences. Getting to know the histories of different social groups is a tool which can help decrease social conflicts and prejudices, can effectively support mutual understanding and promote the creation of coexisting multi-perspective interpretations. It is necessary for this that we not only present histories but – for example in the case of the history of women's education – build on the basic (in this case gender) theoretical and methodological frames.

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A New Hybrid Meta-heuristic Approach for Stratified Sampling

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Abstract

Stratified sampling is a methodology of dividing members of population into homogeneous subgroups before sampling. The aim of this paper is solving the combined problem of stratification and sample allocation with the hybrid meta-heuristic. Some numerical examples are given and the performance of hybrid meta-heuristic is compared with the Kozak's random search (RSM) (2014) and Keskintürk and Er's GA (2007) methods. The results show that the new hybrid meta-heuristic for stratified sampling provides same or better results.

Keywords: Stratified sampling, Stratification, Sample allocation, Hybrid Meta-heuristic

Introduction

Stratified sampling is a methodology in which the elements of a heterogeneous population are classified into mutually exclusive and exhaustive subgroups (strata) based on one or more important characteristics (Cyert & Davidson, 1962). Stratified sampling involves taking a sample without replacement from each subgroup (Hedlin, 2003), and then combining those selected samples from each stratum. An extensive literature is available on the principles of stratified sampling, e.g. Cochran (1977).

One of the main objectives of stratified sampling is to reduce the variance of the estimator and to get more statistical precision than with the simple random sampling (Cochran, 1977). This objective is best achieved when the variability within each stratum is small and the stratum means are different from one another (Cyert & Davidson, 1962).

In this paper, in order to minimize the variance of the estimator, we first propose a hybrid meta-heuristic approach for the determination of stratum boundaries, using proportional, and Neyman allocation of sample elements among the strata. We then show how the hybrid meta-heuristic is used in both stratum boundary determination and sample size allocation. In the application of our proposed hybrid meta-heuristic approach, the total sample size and the number of strata are predetermined.

The paper is organized as follows: In the second section, stratified sampling is discussed. In the third section, we give a brief description of the hybrid meta-heuristic. The fourth section gives computational results, concluding remarks and future research.

Literature Review

STRATUM BOUNDARY DETERMINATION AND THE SAMPLE ALLOCATION METHODS

Khan et al (2009) compare the proposed method with the Dalenius and Hodges' cum \sqrt{f} method (Dalenius & Hodges, 1959) and show how the proposed technique using dynamic programming is effective in determining the optimum strata boundaries. The advantage of the dynamic programming method is that it gives the global minimum of the objective function and it does not require any initial approximate solutions. A numerical example using a hospital population data is presented to illustrate the computational details of the solution procedure. From the experimental results they conclude that the proposed method within our frame work yields a gain in relative efficiency (Khan, Ahmad, & Kahn, 2009).

Brito et al. (2010) suggested that an iterative local search (ILS) meta-heuristic algorithm would obtain a good feasible solution. It is a search-based method that is intended to work for variables with any distribution. They implemented their algorithm on sixteen skewed populations; some real and some simulated, and showed that it produced better solutions than the random search algorithm of Kozak (2004) in most cases (Brito, Ochi, Montenegro, & Maculan, 2010).

Brito et al. (2010) suggested an algorithm based on using minimal path in a graph, and claimed that it guarantees optimum stratification boundaries. They tested the algorithm using real data from the Brazilian Central Statistics Office, and provided the CPU time for the algorithm's implementation; in some cases this was nearly three minutes (Brito, Maculan, Lila, & Montenegro, 2010).

Horgan (2011) suggest a modification, adding empirical rules for determining end points, outliers, take-none and take-all strata in order to improve the efficiency and ensure a feasible set of boundaries (Horgan, 2011).

Er (2012), examines the improvement in the efficiency ratios and stratum boundaries obtained with (Lavallée & Hidirolou, 1988), Kozak (2004) and Keskindürk and Er's (2007) methods once the initial boundaries are obtained with geometric method (GA_GM). With the stratification of 16 heterogenous

populations that have different properties, higher variance of the estimates or infeasible solutions can be observed. As a result, researchers should be much more rigorous when using geometric method for the initial boundaries in algorithmic methods or else use the modified version of geometric method once the data has very extreme values (Er, 2012).

Kozak (2014), suggested that quite likely genetic algorithms have potential to be a means of very efficient stratification, especially in complex stratification problems.

THE DETERMINATION OF THE STRATUM BOUNDARIES AND SAMPLE ALLOCATION WITH HYBRID META-HEURISTIC METHOD

Several algorithms are derived for constructing stratum boundaries in the literature. The cumulative root frequency method of Dalenius and Hodges (1959) is the most widely used. More recently Lavallée and Hidioglou's (1988) method of minimizing the sample size for a given level of precision and Gunning and Horgan's (2004) method of equalizing the coefficients of variation have been derived specifically for skewed populations. In the present paper, we adopt the general strategy of minimizing the variance of the estimator $V(y_{strat})$ and introduce a GA approach for the determination of stratum boundaries. In order to explore the efficiency of GA approach, we compare its efficiency with the geometric and the cumulative root frequency method. For details of the application of the geometric approach see Gunning and Horgan (2004).

When the question is to allocate the sample size among strata, there are several alternative methods such as equal, proportional, and Neyman allocation (Neyman, 1934; Hess, Sethi, & Balakrishnan, 1966). The equal allocation method is the simplest method where each stratum sample size is the same. With the proportional allocation method, the sample sizes in each stratum are proportional to the size of that stratum. These two methods are efficient and suitable if the variances within the stratum are similar (Cyert, & Davidson, 1962). On the other hand, if the stratum variances differ substantially, as in for example highly skewed populations, the Neyman allocation method should be used. This method is based on the principle of sampling fewer elements from homogeneous strata and more elements from strata with high internal variability. In this study sampling costs are assumed to be equal for all strata.

The following notation will be used throughout the paper:

Y	:	stratification variable
N	:	population size
N	:	sample size
H	:	number of strata
N _h	:	number of elements in stratum h (h=1,...,H)
n _h	:	sample size in stratum h
σ_{yh}^2	:	variance of the elements in stratum h
\bar{Y}_h	:	mean of elements in stratum h
\bar{y}_{strat}	:	estimated mean in stratified sampling

Estimated mean and the variance of the estimated mean \bar{y}_{strat} is given by Cochran (1977)

$$\bar{y}_{strat} = \frac{\sum_{h=1}^H N_h \bar{y}_h}{N} \quad (1)$$

$$S_{y_{str}}^2 = \frac{1}{N^2} \sum_{h=1}^H N_h^2 \frac{\sigma_{yh}^2}{n_h} \left(1 - \frac{n_h}{N_h}\right) \quad (2)$$

where the variance of each stratum is assumed known and calculated as follows:

$$\sigma_{yh}^2 = \sum_{i=1}^{N_h} (Y_{hi} - \bar{Y}_h)^2 / (N_h - 1) \quad (3)$$

where Y_{hi} is the i th element in the h th stratum.

It is assumed in Eq. (3) that $N_h > 1$; clearly when $N_h = 1$, there will be no deviation. Sample sizes n_1, \dots, n_H are allocated with proportional, and Neyman allocation methods and these methods are briefly summarized below:

Proportional allocation method:

$$n_h = n \frac{N_h}{N}, \quad h = 1, 2, \dots, H \quad (4)$$

Neyman allocation method:

$$n_h = n \frac{N_h \sigma_{yh}}{\sum_{i=1}^H N_i \sigma_{yi}}, \quad h = 1, 2, \dots, H \quad (5)$$

In this paper we used genetic algorithm selection, mutation operators to determine the stratum boundaries and sample allocation. Our Hybrid Meta-heuristic uses GA operators and local search together. Keskinturk and Er (2007) used binary and real-valued chromosome structure in their work. In this paper instead of the binary and real-valued chromosome structure, we use real values to determine sampling and stratum boundaries. Operators are modified by these new structures. Thus, the chromosome length is reduced.

The principle of our genetic algorithm based hybrid meta-heuristic is given as follow:

Start : Generate random initial generation
Fitness Function : Evaluate the fitness of each chromosome
Local Search : Local search for boundaries and sample size
Selection : Select the better individuals for the next generation
Mutation : With a mutation probability, mutate new offspring
Loop : If stopping criterion is not reached go to fitness function
Stop : Return the best solution in current generation

In this paper, real-valued encoding is used for boundary determination sample allocation. Encoding for simple example of the combined stratification problem is illustrated in Figure 1.

Figure 1 Encoding for stratification

467	485	77	3	1
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The number of gene is equal to the number of strata (H). The last gene represents the upper boundary of stratum which comes before the final stratum. Final stratum boundary equal to population size so it is not shown on any gene. The right side of the chromosome represent the sample size of each strata.

After constructing the initial generation, each chromosome is evaluated by an objective function, referred to as a fitness function, from which a fitness value is derived. In our algorithm the fitness value is the variance of estimator in stratified sampling denoted as Eq. (2) that must be minimized through the iteration process.

The next step after determination of the fitness values is the local search process. Local search process briefly summarized below:

Since there is a two sub-chromosome that first part represents stratum boundaries and the second one shows sample sizes of strata, we have used two different operations for local search. For the boundaries we select one of them randomly and move it to the right or to the left. To avoid infeasible solutions, we use a control operator which checks overlap of strata and the size of population that should be equal or greater than 2. For samples, we choose two of them randomly to change their sizes reciprocally.

The next step after local search is the selection process. Selection determines whether chromosomes will survive in the next generation or not, according to their fitness values. Chromosomes with a better fitness value have more chance to survive. In this paper roulette wheel selection, one of the most popular, is used (Keskintürk & Er, 2007).

In this paper random exchange mutation, which is usually preferred on a permutation chromosome, is used. Random exchange mutation is applied so that two positions are selected at random along the chromosome and the genes contained in these positions are exchanged. The reason for using this mutation operator is to guarantee the number of strata be held fixed after mutation.

A Numerical Example

For the comparison we examined (iso487) dataset. Iso487 example consists of 487 Turkish manufacturing firms from the first 500 largest corporations belonging to the Istanbul Chamber of Industry (ISO) in year 2004. ISO collects data on net sales, gross value added, net profit, etc. of its members and publishes the data of the first 500 corporations annually. Same dataset used by Kozak (2014) and Er (2012) for the comparison in their papers.

Iso487 example is divided into 2, 3, 4, 5, and 6 strata. For 2, 4, and 5 strata cases, the total sample size is 80. In order to allocate the total sample size into 3 and 6 strata evenly with the equal allocation method Keskintürk and Er (2007) increased the sample sizes to 81 and 84 for iso487 example. For comparison we used same sample sizes into 3 and 6 strata. Er (2012) used iso487 dataset and divided into 2, 3, 4, 5, and 6 strata. All strata sample size is 100. For comparison we used same sample size and run algorithm for 100 sample.

We implement our proposed hybrid meta-heuristic algorithm using Matlab programming language on a PC (Pentium 4 CPU 3.00 GHz, 512MB RAM). In order to compare the efficiency of the methods the

variance of the estimator given with Eq. (2) is calculated. Relative efficiencies (%) of hybrid meta-heuristic algorithm to other methods for the iso487 population used by Keskindurk and Er (2007), calculated as ratios of the variance of the estimator from the hybrid meta-heuristics to the variance of the estimator from the other methods. Table 1 and Table 2 presents relative efficiencies for the iso487 population.

Table 1 Efficiency of the estimators for stratification examples obtained with GA, RSM and hybrid meta-heuristic

<i>H</i>	Keskindurk and Er (2007)			Kozak (2014)		Hybrid MH
	<i>Proportional</i>	<i>Neyman</i>	<i>GA</i>	<i>Proportional</i>	<i>Neyman</i>	
2	0,11765	1,00000	1,00000	0,13263	1,00000	1,00000
3	0,07426	0,93029	1,00000	0,07426	1,00000	1,00000
4	0,04745	0,65572	1,00000	0,05285	1,00000	1,00000
5	0,04038	0,51796	0,92173	0,04216	0,99990	1,00000
6	0,02511	0,41054	0,98082	0,02659	0,99999	1,00000

Table 2 Efficiency of the estimators for stratification examples obtained with ga_gm and hybrid meta-heuristic

<i>H</i>	Er (2012)	Hybrid MH
	<i>GA_GM</i>	
2	-	-
3	1,00000	1,00000
4	1,00000	1,00000
5	1,00000	1,00000
6	0,99800	1,00000

GA, RSM, GA_GM and Hybrid Meta-heuristic results of stratum sizes, which correspond to stratum boundaries and sample sizes for all of the numerical examples, are reported in Table 3 and 4.

Table 3 Stratum boundaries for the iso487 example with GA, RSM and Hybrid Meta-heuristic

		Keskindürk and Er (2007)					Kozak (2014)					Hybrid MH	
		Neyman		Proportional		GA	Neyman		Proportional				
H		N	n	N	N	N	n	N	n	N	n	N	n
2	1	485	79	442	35	442	35	442	35	477	78	442	35
	2	2	1	45	45	45	45	45	45	10	2	45	45
3	1	467	77	357	25	351	26	351	26	467	77	351	26
	2	18	3	83	9	99	18	99	18	18	3	99	18
	3	2	1	47	47	37	37	37	37	2	1	37	37
4	1	460	75	141	1	251	13	251	13	431	70	251	13
	2	19	3	236	22	126	12	126	12	43	7	126	12
	3	6	1	61	8	68	13	68	13	11	2	68	13
	4	2	1	49	49	42	42	42	42	2	1	42	42
5	1	393	64	13	1	225	14	162	5	381	62	163	5
	2	74	12	217	14	130	13	129	7	81	13	129	7
	3	13	2	41	3	67	13	86	8	16	3	85	8
	4	5	1	35	4	34	9	62	12	7	1	62	12
	5	2	1	58	58	31	31	48	48	2	1	48	48
6	1	352	60	113	4	158	7	158	7	351	60	158	7
	2	87	15	89	1	113	7	107	6	90	15	108	6
	3	29	5	71	2	81	7	86	8	29	5	85	8
	4	12	2	120	10	49	8	43	5	9	2	43	5
	5	5	1	30	3	40	9	45	10	6	1	45	10
	6	2	1	64	64	46	46	48	48	2	1	48	48

Table 4 Stratum boundaries for the iso487 example with GA_GM and hybrid meta-heuristic

<i>H</i>		<u>Er (2012)</u>		<u>Hybrid MH</u>	
		<u>GA_GM</u>			
		<i>N</i>	<i>n</i>	<i>N</i>	<i>n</i>
3	1	312	23	312	23
	2	120	22	120	22
	3	55	55	55	55
4	1	229	14	229	14
	2	128	13	128	13
	3	74	17	74	17
	4	56	56	56	56
5	1	163	8	163	8
	2	129	11	129	11
	3	85	12	85	12
	4	54	13	54	13
	5	56	56	56	56
6	1	158	10	158	10
	2	108	9	108	9
	3	85	10	85	10
	4	42	7	42	7
	5	39	9	38	8
	6	55	55	56	56

This paper shows that our hybrid meta-heuristic algorithm improved the efficiency ratios of Keskindürk and Er (2007) , Er (2012) and Kozak's (2014) methods. We plan to apply our method to different problems and also to multivariate stratification.

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Critical Analysis of the Concept of Intellectual Capital Investment

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Abstract

The aim of the research is to analyse the concept of the intellectual capital investments in order to clarify the definition and understanding of the concept for business society at enterprise level. There is no unique approach how to define intellectual capital investments. The definition of intellectual capital investments depends on the aim of study or practical implementation. Some researchers define the investments as a different kind of expenditures according to the intellectual capital components. Other researchers use other definitions of the intellectual capital investments such as intangible investments, knowledge based investments, intangible activities etc. Different points of view interfere the understanding of the concept of the investments at enterprise. As a result entrepreneurs do not invest in intellectual capital. The authors critically analyzed different concepts and clarified the definition of the intellectual capital investments.

Keywords: intellectual capital investments, expenditures, financial performance, non-financial performance.

Introduction

The definition of intellectual capital investments is not clear. There is no unique approach for intellectual capital definition and measurement of the investments. Different researchers suggest various interpretations of intellectual capital investments definition. For instance, Ballester *et al.* (2002) define labor costs as human capital investments. Bandeira *et.al* (2010) found that the market treats R&D expenditures as investments in intellectual capital.

An investment in the intellectual capital is focused on intellectual capital creation. The process is oriented on future benefits creation for achievement of enterprise's goal (Gaponenko & Orlova, 2008). Many researchers analyse the intellectual capital investments as key-drivers for financial performance at the enterprise. The definition of "investment" is focused on financial performance, but intellectual capital investments could be also drivers for non-financial performance such as productivity, quality improvement etc. The non-financial performance could be incentive for financial performance, because the interaction between intellectual capital components influences effectiveness of the investments.

The authors found that the development of the concept of intellectual capital investments could be divided into four stages:

- 1) Changes in resource view approach from "resource-based" to "knowledge-based".
- 2) Development of the definition of the intellectual capital and the determination of the components of the intellectual capital.
- 3) The intellectual capital measurement methods creation.
- 4) The definition of intellectual capital investments development.

In the Last years the resource view approach has changed. The role of intellectual capital has increased. One of the first economists, who used the term „intellectual capital“, was Galbraith J.K. in 1969. Stewart T.A. (1991) was one of the first economists to make deeper research in the field of intellectual capital. He described intellectual capital as patents, processes, management skills, technologies, information about customers and suppliers, and old-fashioned experience. Stewart divided intellectual capital into three parts: human capital, organizational capital and relational capital. Later researches extended the number of components.

According to an increasing role of intellectual capital in entrepreneurship, researchers developed different intellectual capital measurement methods. There are more than 40 methods for intellectual capital measurement, for example, Value Added Intellectual Coefficient (Pulic, 2000), MERITUM (Canibano *et.al.*, 2002). Sveiby (2001) summarized and classified all methods in four groups:

- 1) Direct Intellectual Capital methods (DIC). Estimate the financial value of intangible assets by identifying its various components.

- 2) Market Capitalization Methods (MCM). Calculate the difference between an enterprise's market capitalization and its stockholders' equity as the value of its intellectual capital.
- 3) Return on Assets methods (ROA). Average pre-tax earnings of an enterprise for a period of time are divided by the average tangible assets of the enterprise. The result is an enterprise ROA that is then compared with its industry average.
- 4) Scorecard Methods (SC). The various components of intangible assets or intellectual capital are identified and indicators and indices are generated and reported in scorecards or as graphs.

The aim of current research is to analyse the concept of the intellectual capital investments in order to clarify the definition and understanding of the concept for business society at an enterprise level.

Methodology of Research

The main questions of current research are as follows:

- 1) How do researchers define the intellectual capital investments at the enterprise level?
- 2) Which concepts are related to the intellectual capital investments at the enterprise?
- 3) Is the main purpose of the intellectual capital investments financial or non-financial investments?

The following research hypotheses are developed by the authors:

H1: Different kinds of expenditures such as advertising expenditures, R&D expenditures, training expenditures are used as synonyms for intellectual capital investments.

H2: The intellectual capital investments are related not only to financial performance, but to enterprise's non-financial performance too.

The authors used scientific literature content analysis, which is made using software NVivo 10 and consists of these stages:

- 1) Scientific articles selection from scientific data bases Scopus and Science Direct. The authors selected 80 scientific articles using keywords "intellectual capital investments", "intangible assets investments", "intangible investments" and according to them the number of citations.
- 2) Selected articles' review and critical analysis. After critical analysis only 51 articles are used for the next stage.
- 3) Selected 51 articles' content analysis using NVivo 10. The authors used a query for word frequency counting as a tool for coding. After that the authors created six nodes with 20 synonyms.
- 4) Results analysis and clarification of the intellectual capital investments definition.

Literature Review

The authors critically analysed research aimed at intellectual capital and intellectual capital investments (see Table 1).

Table 1 The interpretations of the definition of the intellectual capital investments (some examples) [created by authors]

Authors	The interpretations of the definition of the intellectual capital investments
Hall, Griliches&Hausman (1986)	Specific strategic expenditures should be viewed as investments in strategic assets.
Klock&Megna (2000)	Advertising expenditures are used as a measurement for the intellectual capital investments.
Canibano et al. (2001)	Investments are described as intangible activities (dynamic notion). They imply an allocation of resources aimed at: 1) developing internally or acquiring new intangible resources; 2) increasing the value of existing ones; 3) evaluating and monitoring the results of the former two activities.
Corrado et.al. (2002)	Intellectual capital investments are defined as intangible activities for strategic aim achieving at the enterprise.
Ballester et al. (2002)	Labour costs as a measure for human capital investments are used.
Bontis&Fitz-enz (2002)	Training and development expenditures are used as proxies of human capital investments
Andriessen&Stam (2005)	They use values of intellectual capital as the intellectual capital future perspectives, which give insight into the future power of an organization.
Corrado, Hulten & Sichel (2006)	Expenditures related to software, innovative property, economic competencies are used as the intellectual capital investments.
RICARDIS project (2006)	As a definition of investments, innovation expenditures are used, which consist of internal and external R&D expenditures, acquisition of machinery, training and license.
Bandeira&Afonso (2010)	R&D expenditures are used as a synonym for intangible capital investments.
Awano, Franklin, Haskel&Kastrinaki (2010)	Intellectual capital investments are defined as expenditures in training, software, R&D, reputations, brand, and design and business process improvement.
Zeghal&Maaloul (2011)	Intangible investments are the main values creator.
Pekkola (2011)	An enterprise' capital formation expenditures
Molodchik et.al. (2012)	Intellectual capital investments are an intellectual capital part, which a company invests in order to gain competitive advantage and to improve performance which then causes an increase in company value.

The intellectual capital investments are analyzed in different contexts: financial and non-financial performances. The main outputs can be determined at microeconomic (enterprise) level (white colour) and macroeconomic (national economy) level (light grey colour) (see Fig.1.).

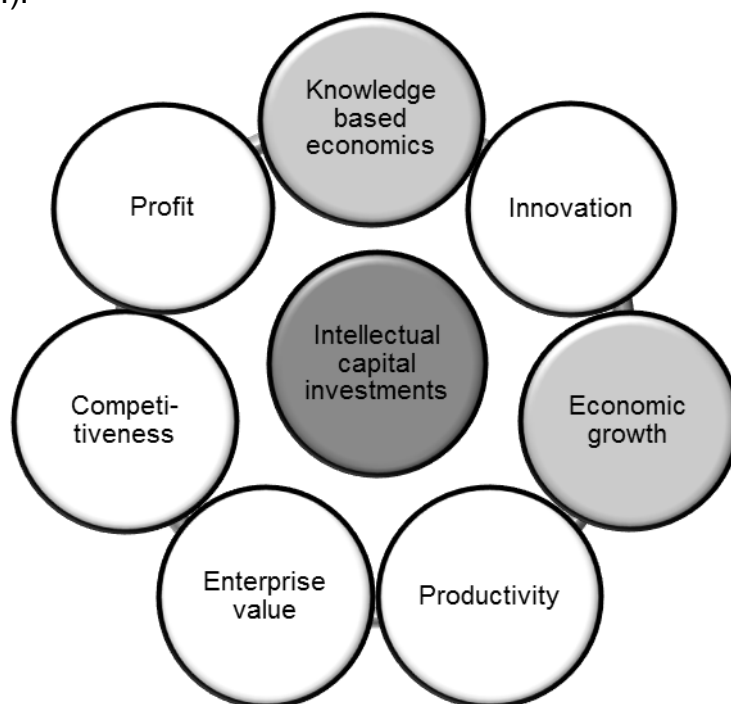


Figure 1 Concepts related to the intellectual capital investments outputs [created by authors]

The main outputs are: at microeconomic level - profit, competitiveness, firm value, productivity, innovation and at macroeconomic level – knowledge based economics and economic growth.

Researchers define intellectual capital investments as different kinds of expenditures or costs, for example, advertising expenditures, R&D expenditures, labour costs etc. This approach is used because these expenditures are easy to identify and they can be measured using enterprise accountancy information and statistical data. This approach is related to the intellectual capital investments objects too. At present there are four main interpretations of the intellectual capital definition: knowledge based capital, intangible assets, intangible resources and intellectual property. Sometimes these definitions are used as synonyms. But that is incorrect. Each definition is used by a different group of people according to their professional field, for example, accountants use “intangible assets”, and lawyers use “intellectual property”. The definitions mentioned are not synonyms, because sometimes intangible resources are not an intellectual capital. Intellectual capital involves intangible assets and intellectual property. Therefore the authors can conclude that main intellectual capital investments objects are intangible assets and intellectual property, which can provide benefits for an enterprise.

In order to answer to the main questions of the current research the authors used scientific literature content analysis. Content analysis is made using software NVivo 10 and described in the section Methodology of Research.

The second step was text coding. Six nodes with 20 synonyms were created on the basis of query and critical literature review. The main nodes are: Intellectual capital investments; Financial Performance, Non-Financial Performance, Investments, Expenditures, Firm Value, Risk.

$$S_j = a/(a + b + c) \quad (1)$$

The calculations show that a correlation between “intellectual capital investments” and “expenditures” is at the average level (Jaccard's coefficient is 0,232996). It means that researchers treat expenditures as the intellectual capital investments, but expenditures

and intellectual capital investments are not synonyms. The first hypothesis of current research is not approved.

$$r_{xy} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{(n-1)s_x s_y} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \sum_{i=1}^n (y_i - \bar{y})^2}},$$

(2) Where \bar{x} and \bar{y} are the sample means of X and Y , while s_x and s_y are the sample standard deviations of X (Székely & Rizzo, 2009).

The authors found out a relationship among “Intellectual capital investments”, “Financial performance”, and “Non-financial performance”, which is proved by the results. (see Table 2).

Table 2 The relationship among intellectual capital investments, financial performance and non-financial performance [created by authors]

Node A	Node B	Pearson correlation coefficient
Nodes\\Intellectual Capital Investments	Nodes\\Financial Performance	0,85
Nodes\\Non-Financial Performance	Nodes\\Intellectual Capital Investments	0,82
Nodes\\Intellectual capital investments	Nodes\\Firm Value	0,54
Nodes\\Risk	Nodes\\Intellectual Capital Investments	0,47

The cluster analysis shows that intellectual capital investments are connected to financial and non-financial performance, but expenditures are connected to firm value (see Fig. 3.).



Figure 3 Cluster analysis results of the nodes [created by authors]

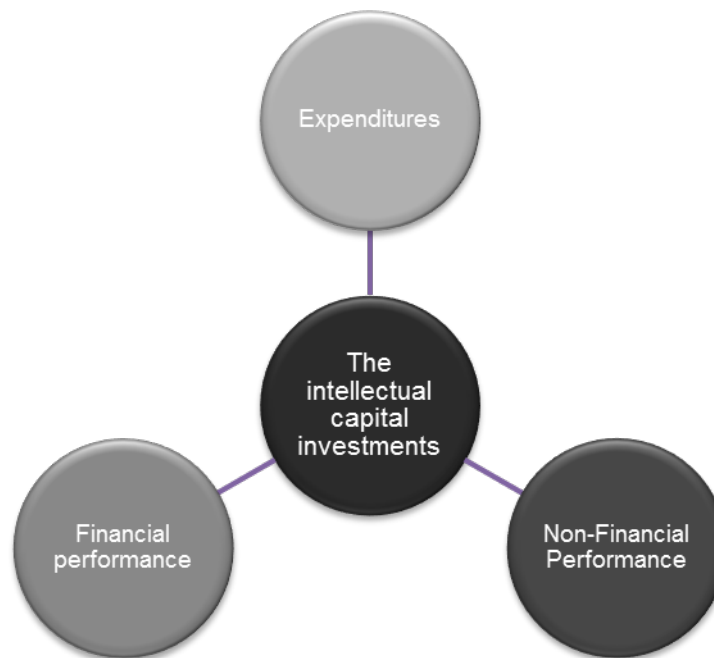


Figure 4 The concepts related to the intellectual capital investments [created by authors]

According to the analysis and calculations, the authors conclude:

- 1) Human capital investments, R&D expenditures, IT expenditures, labour costs, training costs as intellectual capital investments are used more frequently.
- 2) Intellectual capital investments influence the enterprise's financial and non-financial performance. The second hypothesis of current research is approved. Making investments the enterprise could increase not only its profit, firm value, asset value, but productivity, quality, competitiveness, loyalty of clients and employees etc. Some researches show, that non-financial performance could be incentive for financial performance at the enterprise.
- 3) Intellectual capital investments positively influence firm value (market value). There are many researches about market value increasing by making intellectual capital investments. Many researches are made on the basis of American, UK or Asian companies.
- 4) The intellectual capital investments are risky. Different researches provide contradictory results. They depend on the region in which the research took place and the region's economic development.
- 5) A critical analysis of articles shows, that expenditures are often used as investments in studies about investments influence on financial performance and market value.
- 6) The authors found an important problem to be solved: the expenditures can be recognized as intellectual capital investments, if they can be reflected in accountancy. Many researchers emphasise, that it is one of the most important factors, which impedes intellectual capital investments at the enterprise level.

Content analysis shows, that the most related concepts to intellectual capital investments are expenditures, financial performance and non-financial performance (see Fig.4.). Therefore, the authors clarified the definition of intellectual capital investments as follows: *the intellectual capital investments are expenditures in different intangible assets (software, brand, loyalty programs, routines and processes etc.) and human resources of the enterprise for its financial and non-financial performance.*

Conclusion

The authors have analyzed different researches about intellectual capital investments and conclude that there is no unique understanding of intellectual capital investments. Some of researchers use expenditures as investments definition; some use intangible investments or intellectual capital investments. This approach does not improve understanding of investments and their role in entrepreneurship. One of the reasons of it is accounting standards: many of them do not disclose investments in balance sheets.

The authors found answers on current research questions:

- 1) The calculations show that a correlation between “intellectual capital investments” and “expenditures” is at an average level. Some researchers use expenditures as the intellectual capital investments, but expenditures and intellectual capital investments are not synonyms. The first hypothesis is not approved.
- 2) The main concepts related to the intellectual capital investments concept are financial and non-financial performance, expenditures, risk, firm value. The main outputs of investments are divided into two groups: microeconomic level and macroeconomic level.
- 3) The main purpose of intellectual capital investments is enterprise performance: financial and non-financial performance. Some entrepreneurs make investments for profit only; some make investments for business processes improvement. The second hypothesis is approved.

The clarified definition by the authors of article combines a relationship between different definitions and indicators and helps understand the concept of intellectual capital investments at the enterprise level.

Due to critical literature review the authors have found that intellectual capital investments influence on enterprise performance is not unambiguous. Some research results show positive influence on entrepreneurship results, some researches show negative influence, and some researchers found no influence on entrepreneurship (for example, in Russia, South Africa etc.). The authors emphasise that intellectual capital investments should stimulate non-financial performance and they can provide more relevant benefits for the enterprise, because of interaction between non-financial and financial performance.

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Where we are in the 21st century: Bringing out the voices of people with intellectual disabilities

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Abstract

Recent changes in the field of special education have led to a greater focus on agency, self-advocacy and rights of persons with intellectual disability (ID). It is increasingly acknowledged that the views and experiences of people with ID are important, and need attention (Claes, et. al., 2012; Petry & Maes, 2008; Ramcharan & Grant, 2001; Tangen, 2008; Young & Cheeson, 2006). A number of researchers, conducting both qualitative and quantitative studies, started collecting data directly from people with ID (e.g., Claes et al., 2012; Cooney, Jahoda & Knott, 2006; Faragher & Brown, 2005). We now know more about the challenges that have surfaced, as well as the strategies that have been put in place to address them.

This paper first introduces challenges and strategies found in the literature, using Tourangeau's model of survey response process as a working framework (Tourangeau, Rips & Rasinski, 2000). We argue that what can be found in the literature is still limited and needs further adaption for research on people with ID, most particularly when collecting self-reported data. As Fujiura (2012) pointed out, "a more nuanced portrait of self-report may yield new opportunities" (p. 354). We share an account of a worked example through our study, and propose a more inclusive adaptation of Tourangeau's model. It is our hope that by making visible the challenges as well as the inclusive strategies involved in our study we are able to provide researchers and practitioners with some useful insight and practical suggestions for their field work.

Key Words: Intellectual disabilities, research methodology, Tourangeau's model

Introduction

Research aimed at people with intellectual disabilities (ID) has traditionally faced a conundrum related to the issue of voice. Voice is important, particularly when investigating subjective issues, as it is thought that people have “privileged access” to their own minds (Alston, 1971, p.223). However, research involving people with an intellectual disability has most often relied on proxy accounts, instead of tapping on the direct voice. For example, in their quality of life study of 94 people with ID and autism, Beadle-Brown and colleagues (2009) collected direct data from 12 persons and proxy data for the other 72 persons, either from a parent or a caregiver. Alverson and colleagues (2010) conducted a literature review of post-school outcomes data collection methods among those studies. They found that in more than half of the 100 studies reviewed, the respondents were either proxies, or not reported at all. Researchers have also noted that the evaluative method of using proxy responses does not offer a compelling theoretical credibility (Rapley, Ridgeway, & Beyer, 1998). On the other hand, the overwhelming focus on proxy data is perhaps understandable, given the particular challenges of research with persons with ID. It is increasingly acknowledged that the views and experiences of people with ID are important, and need attention (Claes, et. al., 2012; Petry & Maes, 2008). As a result of their work, we now know more about the challenges that have surfaced, as well as the strategies that have been put in place to address them.

Tourangeau’s model of survey response (Tourangeau, 1984) has been adopted among many studies to investigate how people answer and respond to questions (Ryan, Gannon-Slater, & Culbertson, 2012; Schwarz, 2007; Tourangeau & Bradburn, 2010; Tourangeau, Rips, & Rasinski, 2000). Comprising four major components, the foundational component is *comprehension*, which entails correctly understanding and interpreting questions by being able to attend to questions and instructions, identifying right focus of questions and link relevant concepts to key terms of questions (Tourangeau, Rips, & Rasinski, 2000). The second component of the model is *retrieval*, which involves a series of recalling tasks by adopting strategies and cues to retrieve specific events, and making inferences to fill in gaps in partial recollections (Ryan, Gannon-Slater, & Culbertson, 2012). The third component of responding is *judgment*, which can be seen as the process of using information from the stages of comprehension and retrieval to formulate answers to questions. The fourth component of the model is the production of *response*, in which process respondents actively map their judgment onto response options and edit their answers (Tourangeau, Rips, & Rasinski, 2000). Note that the components should not be treated as linear, although they are represented as such (see Table 1). That is, in the actual survey response process, these components may come into play at any stage.

Component	Specific Processes
Comprehension	<ul style="list-style-type: none"> • Attend to questions and instructions • Represent logical form of question • Identify question focus (information sought) • Link key terms to relevant concepts
Retrieval	<ul style="list-style-type: none"> • Generate retrieval strategy and cues • Retrieve specific, generic memories • Fill in missing details
Judgment	<ul style="list-style-type: none"> • Assess completeness and relevance of memories • Draw inferences based on accessibility • Integrate material retrieved • Make estimate based on partial retrieval
Response	<ul style="list-style-type: none"> • Map judgment onto response category • Edit response

Table 1: Tourangeau's Model (Adapted from Tourangeau, Rips, & Rasinski, 2000, p.8)

Strategies and challenges in research with people with ID

Studies involving persons with ID often screen potential participants for severe language and communication difficulties (Booth & Booth, 1996; Finlay & Lyons, 2001; Fujiura, 2012). However, even among selected (and therefore “capable”) participants, difficulties may exist. Thus, a finer analysis employing Tourangeau's model seems productive. In terms of the component of Comprehension, people with ID usually ‘mis-interpret’ question content and intent. Fujiura (2012) gives the example of the use of the seemingly simple word “friends”, which can carry widely variable meanings for persons with ID, depending on their social histories. In terms of Retrieval, researchers have reported the problem of ‘recency bias’, or the tendency of persons with ID to select the last option from multiple-choice type questions (Perkins, 2007; Stancliffe, 2000). Recency bias can hinder their process of retrieving memories and cues to answer questions. Most challenges seem to relate to Judgment. Participants may have problems making ‘time-based judgments’ or with making ‘direct comparisons’ (Finlay & Lyons, 2001). For example, participants, when being asked about a specific event, may report inaccurate dates and times. Direct comparison in questions, such as “Do you feel closer to your parents or to your friends?” can also be difficult. From the perspective of Response, people with ID may have ‘limited verbal language’, which can affect their responses to questions (Booth & Booth, 1996; Finlay & Lyons, 2001). Another challenge is that of ‘acquiescence’, or saying yes, regardless of question content, which is prevalent among people with ID (Perkins, 2007; Ramirez, 2005; Sigelman, Buhd, Spanhel & Schoenrock, 1981). This tendency, which is often seen as an expression of social desirability or submissiveness, can definitely interfere with Response.

Researchers have proposed and adopted strategies to address these challenges. An essential strategy would be that of ‘simplifying language’. Shorter sentence structures and more specific vocabulary usually make questions more accessible to these participants and can mitigate the comprehension challenge. Researchers could reduce or avoid questions that involve direct comparisons (Finlay & Lyon, 2001). Due to the above mentioned challenges, it is not

uncommon to collect information by communicating with a third party other than respondents with ID, which takes the form of proxy data (e.g., Beadle-Brown et al., 2009) as opposed to direct data (e.g., Cui, Stapleton, & Suttle, 2008).

Some researchers have pointed out that ‘open-ended questions’ may work better in flexibly accommodating the retrieval and judgment behaviours of people with ID, thus reducing the occurrence of recency bias and acquiescence (Booth & Booth, 1996; Finlay & Lyon, 2001). ‘Situational marker’ is another strategy that can be used as support for time-based questions that challenge this population. A significant event can be identified in the respondent’s life (by gathering such information prior to interview), and used as a marker for questions relating to that period of time of the event happened (Finlay & Lyon, 2001).

Component	Challenge	Strategy
Comprehension	<ul style="list-style-type: none"> Mis-interpretation 	<ol style="list-style-type: none"> 1. Screening participants 2. Simplifying language 3. Collecting proxy data
Retrieval	<ul style="list-style-type: none"> Recency bias 	<ol style="list-style-type: none"> 1. Screening participants 3. Collecting proxy data 4. Using open-ended questions 5. Using situational marker questions
Judgment	<ul style="list-style-type: none"> Recency bias Difficulty in time-based judgment Difficulty indirect comparison 	<ol style="list-style-type: none"> 1. Screening participants 3. Collecting proxy data 4. Using open-ended questions 5. Using situational-marker questions
Response	<ul style="list-style-type: none"> Recency bias Acquiescence Limited verbal language 	<ol style="list-style-type: none"> 1. Screening participants 3. Collecting proxy data 4. Using open-ended questions 5. Using situational marker questions

Table 2: Consolidation of Challenges and Strategies to Tourangeau’s Model

An account of a worked example

In the following sections, we share a worked account of how we fine-tuned our strategies to become more inclusive in nature, and as such, more accessible to our participants.

This research project is a Quality of Life (QOL) study focusing on the post-school outcomes of youth with mild ID in Singapore, using a mixed methods design of qualitative and quantitative measures. The QOL framework that forms the basis of our project underscores the focus of our investigation, namely the views and experiences of our participants. As such, it is of critical importance that participants’ voices be heard directly, and not through proxies. Participants were recruited with the assistance of our collaborating organization, an adult centre that works with persons with ID. A total of 106 participants, all with mild ID and in the age range of 19 to 34, agreed to participate in our study. Parental consent was also obtained for all participants, in keeping with the protocols that we set together with our collaborator. This research project received ethical approval from the authors’ affiliated institute of higher learning.

The instrument used in the study is the Quality of Life for Persons with Intellectual/Development Disabilities questionnaire (QOLP-ID/DD) (Renwick & Myerscough, 2012), based on a Quality of Life conceptual framework by the Centre for Health Promotion in Toronto (Raphael, Brown, Renwick & Rootman, 1996). It has an open-ended interview format and the questionnaire can be presented and completed through “a series of short conversations” (Renwick & Myerscough, 2012, p.15). Basically key questions – those questions that require responses to be recorded - are accompanied by two or three optional support questions. Support questions can be used to clarify a key question, or to provide some context so as to facilitate the cognitive processing and responses of participants. This enables a more individualized and flexible fit for the study participants, and also strengthens the validity of responses.

Additionally, we carried out a small pilot study with several volunteers with ID, so as to get a sense of potential difficulties and possible solutions to these. Some visual options in the QOLP-ID/DD screening tool were found to be small and unclear. We replaced them with bigger and clearer pictures. Where possible, the new options are also culturally more appropriate in the Singapore context. For example, a picture of a strawberry was replaced with a picture of a durian, which is a common local fruit. The objective of replacing items is to ensure clarity and reduce confusion on part of our participants, thus minimising potential problems at the initial stage of our study.

Additional challenges and strategies identified

In trying to administer the instrument QOLP-ID/DD, we faced most challenges documented in the literature. However, six additional challenges were identified. ‘Guardian interference’ is a unique challenge when conducting research with this special population. The term “guardian” in our context includes the parents or main caregivers of our participants. Most of our participants were accompanied by their guardians when coming for the survey interview. Guardians can be either very protective or domineering during the interview process. Their voice could overwhelm voices of participants. Also, participants were at times easily distracted and showed signs of fatigue, due perhaps to the unfamiliarity of context. Oftentimes participants’ personal contexts play a key role in to engaging them in attending to the survey questions. It is challenging for people with ID to relate their personal experience with others’. This limits their abilities to relating things and become a challenge of ‘disassociated experience responses’ and further hinders the retrieval process during the survey interview. ‘Exam syndrome’ and off-topic responses are two other challenges that our team has encountered. As our participants’ previous experiences with question-and-response situations were mostly restricted to school examinations and tests, they tended to regard our survey as a test with “right” and “wrong” answers. We also found that our participants tended to veer off-topic and sometimes gave responses that were only remotely relevant.

Our research team tackled these challenges with strategies that are presented in the following sections. Numbering of each strategy follows the sequence of previous five strategies reviewed and consolidated earlier in our paper (See Table 2).

6. Preparing the participants. As participants are required to use a Likert-type scale in the questionnaire, we developed a procedure based on the pre-test from ComQol (Cummins, 2005)

to familiarise participants with the use of the Likert scale, using both concrete and abstract references. This was very useful in helping participants with their responses.

7. Re-ordering related questions. The QOLP-ID/DD is a comprehensive questionnaire that covers a wide range of QOL domains. However, the breadth of coverage can make it time-consuming to be administered and completed. Participants with ID may have attention and memory deficits, adding further challenges to their survey response process. Our strategy was to re-order survey questions in the QOLP-ID/DD, by grouping related items together. For example, questions relating to hygiene, body care, self-care routines, neatness and personal appearance were pulled together as a group, while questions relating to socialising and interacting were placed together. These modifications were undertaken to make the interview process more efficient, as the participants can stay on a topic for a while, thus reducing going the back-and-forth present in the original format. We also wished to reduce the time spent on the interview, as long interviews can tire the participant (and often, the interviewer as well). Another concern was that lengthy interviews may affect the quality of responses. Finally, we also felt that the re-organised format simulated the flow of a natural conversation, which could enable the participants to be more relaxed and responsive while answering questions.

8. Simplifying explanation. Much has been written about the importance of clarity of meaning in questions. Finlay and Lyon (2001) described in detail the importance of question content, in terms of vocabulary and abstract concepts, most particularly in questionnaires that assess mental and subjective states, and that involve judgments of frequency or degree. Words in the questions that are unfamiliar, vague or that can be interpreted in different ways should be simplified; alternatively a question can be re-worded. One aspect of comprehending a question is that there are variations in personal definitions of a concept. For example, a question like “Are you okay?” can be understood by participants as a question about whether they are well or sick, or as a question about how they feel. Thus extra care should be taken during the simplification process in retaining the intention of the question (Fujiura, 2012). In sum, the purpose of simplifying questions, and making them as straightforward as possible, is to improve the respondents’ comprehension of questions. During our pilot sessions, the research team noted that one of questions in our survey, “*How much do you think of yourself as a distinct person?*” was not well understood by our volunteer participants. We examined breakdown points for responses from every volunteer participant, and also questioned several of them to get to know how they approached the question before we simplified the question. To make it simpler for participants, we split the question into two parts. The initial question was “*Do you think you are special?*” If the respondent said yes, this was followed up with “*Tell me how you are special?*” If the respondent said no, this was followed up with the support questions that were already provided in the questionnaire: *What kind of person do you think you are? How are you the same as other people? How are you different from other people?* A key aspect of the simplification process in our study is that, as far as possible, we used language at the level of a third grader because the lowest level of comprehension of the participants was about that of a third grade student, although some of them were more capable. Literature also advocates plain language for participants with ID (Cameron & Murphy, 2006; Iacono & Murray, 2003; Roberts & Roberts, 1999). Finally, we also took into account the fact that for many of our participants, English is not their first language, even if they do use it widely in an everyday context.

9. Adding personalised context. Researchers have noted that the reliability of a response can be enhanced if a question is modified to suit participants based on individual backgrounds or experience, without compromising the intention of that particular question. Such contextualisation can facilitate estimations of time (Finlay & Lyon, 2001), and also help with the interpretation and formulation of a response from participants (Fujiura, 2012). In other words, personalised contextualisation can aid respondents with *retrieval* of information from long-term memory, with *judging* the information they have retrieved – how it matches the question that was asked – and with coming up with a *response* (components B, C and D of Torangeau’s model, Table 1).

In the pre-interview preparation, we read each participant’s profiling documents and collected information from the collaborating institution, job coach or guardian to familiarise ourselves with participants’ backgrounds before the survey interview. Thus, we were able to use questions that refer to specific activities. As Finlay and Lyons (2001) noted, “Questions may be more successful when situated in specific contexts or events from the person’s own life (p.330)”. One question in the QOLP-ID/DD that we modified originally asks “*Is it important for you to celebrate special events? How important?*” Before asking this question, our interviewer may build some context by saying “*Let’s talk about your birthday. Do you celebrate your birthday?*” This would lead the participant to remember and talk about his or her birthday celebrations. Only after the participant has shared for a few moments, will the interviewer ask the key question. For those who do not celebrate birthdays, support questions centering on local celebrations like Chinese New Year and Hari Raya are asked. Embedding questions in personal experiences, as described above, was part of our efforts to help with the recall processes of individual participants. Differences in cultural contexts were also addressed. Some questions had to be re-phrased or even changed to suit the Singaporean context. For example, an item in the questionnaire refers to watching people play a game like baseball or hockey, neither of which is much played in Singapore. The games were changed to football and basketball, which are both popular Singapore sports. Finally, to cater to participants who are more conversant in Mandarin, QOLP-ID/DD was translated into Mandarin. Back translation was performed to ensure the evidence of validity. However, in order to establish a confidence level of frequently occurring experiences for some questions, we repeated similar questions in various domains, in which specific activities and single events were referred to. This was partially done when we re-ordered the questions as mentioned earlier and re-enacted through interview. While literature has focused on the need to reduce response biases of individuals with ID in a research context, there is little material on improving the questioning behavior of interviewers. It is a particularly important issue when working with individuals with ID, who may, for example, perceive interviewers as persons of high status (Heal & Sigelman, 1995). This leads us to further look into the improvising interview procedures.

10. Improvising interview procedures. A major contributing factor in inaccuracies of response is the uncertainty of interviewers themselves. Tourangeau, Rips and Rasinski (2000) point out that interviewers should know the definitions of key terms in questions, so that they can offer consistent and appropriate clarification when respondents need them. Finlay and Lyon (2001) also recommend that interviewers use follow-up scripted questions to establish the meaning of the participants’ responses, if needed. The research team put extra effort in training and improving our questioning techniques, based on our experience during pilot sessions. In addition

to modifying key questions as described in the section above, we also selected two support questions from those provided in the questionnaire, and went through the meanings of major concepts and appropriate ways of expressing them.

The strategy of improvised procedures can also be applied to at least four aspects of the interview procedure, although it should be used with caution. One aspect is ‘flexible schedule’. We went down to the center to meet with participants who were clients of the adult center. Participants who were not clients of the adult center, on the other hand, were allowed to choose an interview site and time at their convenience. This meant that interviewers sometimes had to conduct interviews in the evenings, or during weekends. In terms of the second aspect, ‘informal style’, we realised that our participants tended to respond to questions as if they were doing a test, where no matter what options are provided, there is only one right answer. This could perhaps be due to their lack of exposure to surveys. We then adopted a more relaxed, conversational style which also fitted in well with the modified questions. For example, when meeting participants, the interviewer would ask how participants had travelled to the place of interview. Whether they came in their parents’ car, or took the train, bus or taxi, participants’ responses provided a useful point of reference for several key questions on mobility, “Is it important for you to get around? How important?” and, “Are you happy with how you get around? How happy?” Interviewers then fitted in customized support questions such that these questions suited individual participants’ situations. For example, for a participant who took a bus, the interviewer would say, “I remember you said you took a bus here this morning. Do you usually travel on buses? How about trains, do you use the MRT?” If it was a participant who came with her mother in a car, “Earlier you told me that your mother drove you here. Does she usually drive you to places? Have you taken a bus? How about trains, do you use the MRT?” In terms of the third aspect, ‘flexible time’, research on survey response indicates that in general, accuracy of responses improves when respondents are given more time (Blair & Burton, 1987). In cases where respondents have cognitive impairments, this strategy can be particularly helpful, as more time may be used to compensate for processing difficulties. The strategy here was simply to pause after a question and wait (in an encouraging manner). This strategy was applied to all questions. Initially, interviewers had to consciously think to themselves: Pause...Wait. As interviews progressed, as our participants relaxed and talked, the pausing and waiting became more natural and unconscious. Whenever we detected signs of fatigue, breaks were allowed in the process. In terms of the fourth aspect, ‘small talk’, we found that at times during our pilot sessions, our inclination was to ask support questions as soon as we saw a respondent seeming to struggle with coming up with a response to a key question. We addressed this by embedding key questions within a sequence of “small talk”, then the key question, and followed by support questions if needed. This strategy was only used for more challenging questions, such as the key question, “Do you sometimes do things to make yourself feel more peaceful inside?” However, we caution that issues of consistency and validity may be affected with this kind of flexible practice. More discussion regarding this will follow in a later section of this paper.

11. Avoiding the voice of guardians. An important aspect that interviewers need to attend to is that of working with the guardians of participants. The presence of a guardian can be helpful to both the interviewer and the participant - for example, the guardian can provide some background information which can help the interviewer to approach the interview process, while at the same time act as a familiar and supportive presence for the participant during the interview.

On the other hand, there may be a guardian who is over-protective, anxious, or controlling. Learning from the pilot study experience, the research team developed a guardian questionnaire that the guardians could fill on their own while participants were being interviewed. The purpose of the guardian questionnaire was two-fold. Firstly, it served an important means of obtaining another perspective of the experiences of our primary participants. Secondly, it also enabled some triangulating of the data that we obtained from our primary participants. Thirdly and most crucially, since guardians were engaged in completing the parent survey, there was less opportunity for them to overwhelm the participants' voice.

Conclusion

Overall, this current study addressed methodological issues relating to research with participants with ID. As the focus on the voice of marginalised people becomes increasingly important, especially when involving service outcomes and policy making, researchers in fields such as quality of life continue to seek sound research methods to present the true voice of such persons. This study has adapted Tourangeau's original model for participants with ID and provided new observations. The new component of Participation was identified in this inclusive adaptation, arising through the emphasis of participants' voices of this current study. Challenges

adaptation to the Tourangeau's original model to include participants with ID, we did face a dilemma in balancing our methodological decisions between flexible interview procedures and instrumentation issues (e.g., reliability and validity). In order to solicit authentic responses of participants with ID, a more flexible procedure to survey questions is a must. However, flexibility has to be adopted with caution. We invite researchers to address this issue in future studies.

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Introducing Creative Dramatics in Tertiary ESL Education

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Abstract

The value of creative dramatics in ESL education is widely acknowledged. However, many students are unfamiliar, or uncomfortable, with the creative process. This paper proposes a curriculum design aimed at developing skills in creating narrative structures and drama. It is the thesis of this paper that, when given a strong grasp of basic narrative elements and how these elements can be applied to create narratives and dramas, students are able to pursue task-oriented creative dramatic learning projects with greater independence, efficacy, and enthusiasm.

The focus of instruction is to approach the topics of narrative and drama structurally. First, basic elements and structures are defined, followed by the identification of examples of these elements and structures as they operate within popular narratives such as fairy tales or contemporary films. Once students have a working grasp of these elements and structures, they are led through a series of exercises in applying their understanding.

Key Words: ESL; drama; tertiary; education

Introduction

The value of drama-based activities in the classroom is widely acknowledged (Maley, 1982: Way 1-9). One of the main benefits, according to most literature on the subject, is that drama activities generate a creative learning environment (Heathcote, 1984). In tertiary ESL education, drama is incorporated into curriculum in manners that vary widely from drama exercises and games in conversation classes to the ubiquitous graduation dramas that many university English programs perform each year. However, despite such a wide range of application, there is very little material available to ESL instructors on how to introduce what a drama actually is. Particularly, there is a lack of material aimed at giving instructors tools to help them guide students in the creation of original drama projects.

A common technique in ESL classes that use creative dramatic techniques is to give students a conflict or problem, and then ask them to solve the ensuing communication breakdown through dialogue: in essence, to enact a short play. The shortcoming in this sort of exercise is the lack of a clear structure to create dialogue that might give students more confidence to fully explore the dramatic situation, and thus employ a richer variety of language opportunities.

Many tertiary-level ESL programs utilize long-form dramatic projects, such as students developing an original drama for a school celebration or competition, or rehearsing and presenting a pre-written script as a graduation project. But, without an adequate understanding of dramatic structure and elements, students do not have a clear understanding of what a drama actually is, or the tools to work confidently and efficiently in creating one.

One of the goals of creative learning techniques in general, and drama in particular, is to engender a low-anxiety learning atmosphere (Piirto, 2004). In such an atmosphere, students feel more confident, participate more fully, and retain more from their lessons. Research has shown that the use of clear structures and paradigms are an important aspect of reducing anxiety and engendering a creative learning environment. This is because they set very clear guidelines for student participation (Starbuck 2006).

The goal of this paper is to outline the basic elements and narrative structure of drama in order to present educators with tools to develop a creative dramatic curriculum that can be easily taught and implemented in the tertiary ESL classroom. It is hoped that this structural approach to the teaching of creative dramatics will give students the tools necessary to empower them in the creation of original dramatic narratives for language practice and improvement. Additionally, the topics covered in this paper may also be useful for instructors leading students in situations where pre-written scripts are used in classroom settings – especially in the analysis and preparation of these scripts for performance.

This paper will present material for curriculum design through an analysis of the three main elements of a dramatic narrative (*character*, *plot*, and *setting*), and a brief outline of traditional narrative structure. It is the premise of this author, that if these concepts are clearly communicated to students, they will be able, with guidance, to prepare and present original dramatic narratives that will be beneficial for their English language improvement.

Introducing Character

The most basic element of all drama is character. Until this element is clearly defined, there can be no story. But character is much more than a name or an identity. It is the foundational generative force that drives the narrative.

When asking students to contribute ideas for characters in the creation of a drama, the responses will often be occupations (doctor, police officer, teacher), types (old woman, little boy, handsome man), or stereotypes (gangster, movie star, tycoon). These are all good starting points for the creation of character, but simply creating a list of titles or types does not really address the requirements for a drama. For, although there are certain assumed traits that we associate with various character types, titles, and occupations, what do we really know about the movie star, the police officer, or the little boy that makes them distinct and interesting as a character? Nothing really. All we know by a title or type is what might be referred to as a character's role.

The true definition of character is found in need. All characters are defined by their needs. These needs, in turn, drive characters to actions. The results or consequences of these actions generate the emotional dynamics of the drama.

Need

In order for a character to function in a drama, it must have a strong sense of purpose – a need. In fact, need is what actually determines character, and gives the notion of character its utility in drama. For example, what actually sets the role of a police officer apart from the role of an old woman, or a tycoon, are his or her needs. In order to test this notion, simply think about a single need and apply it to all three roles. Love, for instance. It is easy to see that the need for love to be reciprocated will define the police officer, the old lady, and the tycoon more than their roles. Their distinctions are vastly diminished when the same need is applied to all three, and it is easy to imagine all three characters behaving in very similar fashion in order to achieve their need for love. Change the need to a desire for fame, and again, they are all redefined. You can continue with other needs such as power or money and find the same results. This is not to say that roles (titles, occupations, stereotypes, etc) don't have a use in determining how a character will develop – but without a clear need, they will most often remain flat and two-dimensional.

Needs can be discussed and classified in many ways. Perhaps the most well known method is Maslow's (1943) hierarchical pyramid:

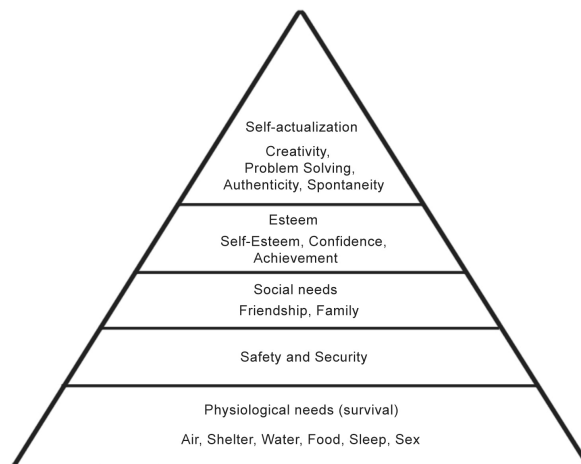


Figure 1: Maslow's Pyramid

Maslow's pyramid is a useful tool in discussing needs conceptually, however its terminology may be too abstract to be of practical use in ESL instruction, and an in-depth analysis of Maslow's theories will almost certainly hinder student engagement in a second-language classroom. Furthermore, when needs are discussed in a classroom setting, the discussions often include, or gravitate towards, material items (money, food, a new car, an ipod, etc), but Maslow's pyramid does not provide a clear context for locating material items in his hierarchy. Thus I would suggest that Maslow's pyramid, although useful, is not ideal for an initial classroom discussion of need.

I would propose that a more useful categorization of needs for the classroom would be tangible or intangible (in an ESL setting, I would suggest using the terms 'things you can touch,' and 'things you can't touch'). In this manner, all imaginable needs are covered, yet there is a simple distinction between those, which can be obtained in a physical manner and those which cannot. This categorization also gives the language learner clear distinctions wherein to locate vocabulary (physical vs. conceptual terms).

Tangible Needs: physical items that can be gifted, obtained, earned, purchased, won, or lost.
(e.g. money, prizes, food, property, etc)

Intangible Needs: emotional or rational concepts that can be felt or perceived.
(e.g. survival, safety, justice, trust, love, power, respect, etc)

The tangible/intangible categorization is a useful tool for introducing the concept of need and how it affects the development of character. For instance, in a particular exercise, the instructor could direct students to come up with only intangible needs (freedom, relaxation, respect, etc), and then pursue those needs in the development of a short improvised drama. Then, with the same groupings, the instructor could direct students to improvise another drama pursuing only

tangible needs (e.g., money, food, clothing, etc). As students advance they might also play with pairing needs from both categories to develop more complex characters and scenarios.

It has been my experience (as mentioned above) that classroom discussions about need generally gravitate rather heavily towards tangible needs. It is usually only after introducing the concept of intangible need that students start to actually consider this category. However, once it is identified, it often becomes a very active part of the discussion, as well as an often-utilized category of need in classroom projects. Thus another benefit of the tangible/intangible categorization is that it seems to draw more attention to the concept of intangible needs – which might otherwise be overlooked or under-explored.

Often, a classroom drama project seems to revolve only around the need (or needs) of the central protagonist. However, it is important to communicate to students that every character has at least one need, however simple it may be, and that they must pursue it in order for their character, and the drama as a whole, to become fully developed. Even a bit character, one that enters just to tell another character a piece of information, has the need ‘to communicate’. For an example, we can take the story of Little Red Riding Hood. It is important for the drama that, just like Little Red, the other characters all have their own needs as well. The wolf must eat to survive. And perhaps his nature as a predator gives him a physical, or instinctual, need to kill. More advanced types of needs for the wolf might be a need for respect as a fearsome animal, or a need for power that he fulfills by killing. Perhaps, comically, the wolf may be lonely and seek friendship with Little Red, but this need for friendship is overcome by his hunger need. Additionally, the grandmother has several needs - even if we don’t see her before she is devoured. Once she is freed from the wolf’s belly she may have a need for revenge, or a need for comfort. The hunter too has needs (to save Little Red and Grandma, to display his prowess, to be a hero). The degree to which each character expresses and pursues his or her needs will help to define his or her character, and the quality of the overall drama. Once this concept is clearly understood by students, they can more actively engage in their roles as they develop the drama.

As a note on need, it should also be mentioned that a narrator is a form of character, and thus must have at least one need. The most common need for a narrator is the need to communicate to the audience. However, more complex narrators may have other needs as well (e.g. respect, power, love, money, food). It is often interesting when a narrator has complex needs that influence the manner in which he or she tells the story - perhaps even drawing the narrator into conflict with the characters in the story.

Action

Need leads to action. When you want something, you naturally take steps to obtain it. If a character is thirsty, they reach for a glass of water. If a character is in love they might approach their love interest with some form of conversation or gift. On the other hand, fear (and the need to be free from fear) might cause them to act bashfully, or run and hide from their love interest. If a character needs money they may engage in work or a task that will pay them for their labor. Or, perhaps they might steal the money. In this regard, all action in a drama can be seen as the result of pursuing a need.

Often students will say that they ‘don’t know what to do next’ when creating a drama. Reminding them to think about their needs can help them to discover their next action. The process of action in a drama is progressive. Each action leads to a reaction, which in turn leads to another reaction, and so on until an ending is achieved. The end of dramatic action can be either

the achievement of need by one or more characters (resolution, transformation), or the revelation of the inability to achieve any needs (stasis). Generally, since learning environments favor a task completion paradigm, it may be beneficial to instruct students to pursue endings that resolve as many of the needs of the characters as possible. Obviously, it will not always make sense for every character's needs to be met – but, at minimum, a situation where the main protagonist or antagonist succeeds will give students a sense of completion.

Emotion

Emotion is directly related to need, because a character experiences emotions relative to their needs being achieved or denied. A character in need of love is elated when that love is reciprocated, lost and heartbroken when not. A character in need of money is happy and relieved when it is available, desperate and anxious when it is not. This direct relationship between need and emotion can be very helpful in training students to create their own dramas. For instance, when students are unsure how to express themselves, they can simply ask themselves to what degree are their needs being met and determine an emotional response to try out.

A useful technique in classroom drama exercises is to encourage students to express themselves with what might be termed 'heightened' or exaggerated emotions. This can serve to counteract the natural human tendency to mute emotional expression in social or public circumstances. This may be because heightened emotional response is, due to its exaggerated quality, clearly not a 'real' emotional response. This in turn alleviates some of the natural anxiety around self-presentation that is inherent in dramatic situations. Students are more aware of pretending when they exaggerate, and thus, paradoxically, it is easier to engage a shy student when they are given the opportunity to overact. Once several students take the initiative to heighten their emotional responses to needs being met or thwarted, the result is rather infectious, and many students who were reluctant to participate on an emotional level engage more wholly in the activities.

A final note on Character

The notion of character should not be limited to human form. As has been demonstrated above, a character is defined not so much as by what it is, but by what it needs. Thus any animal, object, or element of nature can be expressed as a character. For instance, a cloud may need the wind – and these two elements can be expressed as characters with dialogue and movement. A pencil could need an eraser, and thus set off on a journey whereupon it meets a ruler, a coin, and any other assortment of typical desk drawer items. Animals also make for great characters, especially since many animal traits are expressed with common verbal expressions already built into English vernacular; curiosity killed the cat, a dog is man's best friend, proud as a lion, sly as a fox, sneaky like a snake, hungry as a bear, etc. Animals, objects, and natural elements also have the beneficial quality of being so absolutely 'non human' that the risk of revealing one's actual self is less, and thus students generally feel less self-conscious when portraying these roles.

Introducing Plot

Plot is often referred to as the narrative of the drama. This is true, but not all narratives are dramatic. For a narrative to become dramatic there needs to be tension. This tension is arrived at through many avenues: disagreement, competition, envy, greed, malice, desire, curiosity, etc. At its most basic level, tension is the result of a need not being achieved, or in the process of being achieved. Thus, plot is really a term for the chronicle of the difficulties (or problems) encountered in the pursuit of need. Without difficulties, there would be no drama. For instance, if Cinderella's stepmother were a kind and fair woman, there would be no story – at least not one that would be of much interest. Thus at the heart of any truly dramatic narrative are the obstacles to needs. These problems, or difficulties, are often given the general term 'conflict'. A very popular way of categorizing conflict according to this general definition is:

Man	vs.	Man
Man	vs.	Nature
Man	vs.	Himself

This categorization is useful, but may be too general. Additionally, it seems to imply that all conflicts share the same basic nature, and differ only by the parties involved. I would suggest that a more useful way of understanding the obstacles, or problems, a character encounters in pursuit of need would be to categorize them into two basic types: *conflict*, and *complication*.

Conflict

Conflict, according to this categorization, has two major types. First, is the involvement of two or more characters in the pursuit of a single need (e.g. two men love the same woman, a group of contestants compete for a prize, two armies in combat, a political election). The second type of conflict is the involvement of two or more characters in pursuit of different, or conflicting, needs (e.g. a couple want to go to the movies – she wants to see a romance, he wants to see an action film, political parties competing in an election, etc). These conflicts can arise between any combination of individuals or groups:

Individual	vs.	Individual
Individual	vs.	Group
Group	vs.	Group

Complication

The second type of narrative obstacle, according to this new categorization, is complication. Complication arises when the pursuit of need (by a single character, or a group) is thwarted or delayed by factors, either internal or external to the character(s), which do not involve the needs of any other character(s). To put it simply, a complication is a problem without a sentient adversary. Some examples of complications would be: fear, lack of physical strength, natural disasters, a timetable, etc. Complications can generally be categorized as follows:

Individual	vs.	Self
Individual /Group	vs.	Nature
Individual / Group	vs.	Circumstance

Understanding the distinction between conflicts and complications can lead to more focused types of group activities. For instance, in a particular class session, students could be instructed to develop short dramas involving only complications. The nature of addressing complications is such that people tend to work together to solve the problem. In this manner, the task work of each group will have a strong sense of unified purpose to overcoming the obstacle. This is a good tool for developing harmonious group dynamics. Conversely, another class session could be devoted to exploring only conflict type dramas. Here the task emphasis could be placed on resolving the conflicts. It is important to note that conflicts, by their nature, tend to develop into more argumentative situations than complications. When introducing conflicts into class work, it may be wise to give a good introduction on their volatile nature at the onset so that students are not too surprised by the types of interactions that may develop. On the other hand, it is sometimes the volatility of conflicts, and the opportunity to explore them in a safe setting, that stimulates student interaction.

Aristotle (1967), in his Poetics, states that complex plots make for better plays. Although not all of Aristotle's dramatic ideas have held their ground in the modern age, the notion of a complex plot being more interesting and enjoyable is still practically a truism. Perhaps the most efficient way to develop a plot's complexity is by the addition of conflict and complication. The more problems a character (or characters) encounter, the more interesting and enjoyable the drama becomes. With beginning students, it may be enough to have them deal with single conflicts or complications (or a few combined). However, as students become more advanced, they should start to play with multiple combinations of conflict and complication. In doing so, they will start to discover more elaborate and interesting plots.

As an example, we can look to the familiar story of Cinderella. Here, in what is often one of the earliest stories told to children, we find a rather complex plot. Let's first look at the characters of Cinderella and the Prince:

Cinderella's problems:

Her mother has died
Her father has married a horrible woman who treats her as a slave.
Her father seems unable / unwilling to help her.
Her step-sisters torture her.
She has no friends.
She works hard to go to the ball, but is denied.
Her dress, shoes, carriage, and coachmen will all disappear at midnight.
Her stepmother tries to hide her from the prince.
She is afraid the prince will not love her when he sees her dressed poorly.

Prince's problems

He is under pressure to pick a bride.
The woman he likes runs away.
He cannot find the woman whose foot fits the shoe.
He is fooled twice by the stepmother.

We could continue with all the other main characters: Cinderella's father's despair at losing his first wife, and his subsequent isolation from reality; the Stepmother's thwarted

attempts to pass off her two daughters to the prince; the desires of the step sisters to be beautiful, popular, and rich. All of these character needs are problematic and create opportunities for complex mixtures of conflict and complication to be enacted.

Once students become aware of the benefits of increasing the complexity complications, the problem of the ‘blank canvass’ typically evaporates. Furthermore, the stimulation of the narrative as a result of increased complexity adds not only interest to the story, but also more individual opportunities for students to participate in the drama. Indeed, the more complex the plot becomes, the more each character has to do in order to resolve the drama. Once this attitude is adopted, the process of creating a narrative truly becomes a task-based activity.

Introducing Setting

Setting is an often overlooked or under-appreciated element in the structure of a drama. Where a drama happens is as important as what happens. Consider, for instance, the popular movie Titanic. At its most basic, it is a love story with multiple conflicts and complications. But would it be as interesting a story if the characters had simply met passing on the street? Could they have even met in that manner? In this instance, setting is crucial to the plot, and even adds an over-arching level of complication to the narrative. The setting itself is a complication. Perhaps the two most common mis-steps when creating a drama are to:

- A) Make no active decision whatsoever about the setting, and thus have no clear concept of the world in which the action takes place.
- B) Assume that the action takes place in a setting that fits too neatly to the characters, and thus results in a clichéd, or unstimulating environment.

Either of these mis-steps at the onset of creating a drama can result in many missed opportunities for dramatic enhancement.

In the first instance (A, above), if no active decision regarding setting is made, then the resulting indeterminacy creates a flat and indistinct world. The opportunity for setting to play an active part in the drama is lost. This is often the case in basic drama activities when students are instructed to adopt two characters and pursue a dialogue. They have no idea where they are, and thus lose the opportunity for setting to enhance their situation. Take, for example, a student-generated dialogue between a boss and an employee. If the students make no clear choice for setting, then the drama will by default seem to happen in an indistinct ‘office’ or ‘work’ location. But if the students ask themselves particularly what sort of business is involved (e.g. shoe store, restaurant, bank, amusement park, etc), then they will have a much clearer sense of how to set their needs and pursue them. For example, the needs of bank teller, a waitress, and a Ferris wheel operator are all quite specifically different.

In the second situation (B, above), even if students do make an active choice, they often rely on typical settings in relation to their characters. The aforementioned boss and employee are set in a shoe store, office, or restaurant (typical locations for this relationship). But if students take a further step in their understanding of setting, then whole new opportunities for dramatic development arise. Again, take the boss and the employee – but this time their setting is in a jail cell, or in a hot air balloon (perhaps one that is losing its air). These non-traditional settings give

the drama specific, yet highly enhanced opportunities for development.

Non-traditional settings can also make an old story new. One need only look at the

relationship of West Side Story to Romeo and Juliet to find a clear example. Here the major setting change is temporal, from pre-Renaissance Verona to modern mid-town Manhattan. The characters do not change drastically, but the opportunities for conflict and complication are opened to new possibilities. Issues such as ethnicity and class are brought to the fore.

Furthermore, setting can have an effect on more than just the theme of a drama. Once again consider Little Red Riding Hood. But now, instead of the familiar setting of a journey from the village into the forest (a place of danger and mystery), relocate it to a modern inner city, where the forest becomes the subway system (a place of danger and vulnerability in many cities). Now the setting enables the familiar story to be enhanced by the incorporation of new characters and problems. Even more, it encourages the transformation of characters into new forms. Perhaps the wolf is no longer an animal, but rather a menacing gangster. The hunter could be a detective on his trail. It is the same story outline, but now with new character types and many opportunities for students to discover character and plot. All this is the result of one clear choice in setting.

The power of setting to create dramatic opportunities is perhaps the most under-utilized aspect of creative dramatic exercises. If students do not make clear choices in the setting of their dramas, they will most often fall back on vague or uninteresting settings, which will cut them off from vast opportunities for character and plot development. If, on the other hand, students learn to explore alternate and non-traditional settings, there is no limit to the creative potential that they may unleash.

Introducing Narrative Structure

When viewed as a whole, the work of organizing the various needs and actions of characters into a complex narrative that builds dramatic tension seems to be a rather daunting task. But, if the work of creating a narrative is broken down into its constituent stages, it becomes much more manageable. This is the key notion to communicate to students at the onset of a creative dramatic project.

The traditional narrative structure of drama is rather simple and easy to communicate to students. This is because they encounter it on a regular basis. For, although most modern students do not attend the theatre or read plays, this structure is evident in most modern movies and television dramas. However, despite their familiarity with traditional dramatic structure, many students are unclear on how to identify and analyze the various stages in a dramatic narrative. Fortunately, once given a clear structural outline, and provided with simple terminology for these stages, most students are able to easily understand and discuss these stages.

In the late part of the 19th century, German novelist and playwright Gustav Freytag outlined five stages of dramatic progression that have become the basis for much of our modern understanding and analysis of dramatic structure (Freytag, 1900). Freytag termed these stages *Exposition*, *Rising Action*, *Crisis*, *Falling Action*, and *Dénouement*. These stages can be briefly defined as follows:

Exposition – the introduction of the characters and setting of the scene.

Rising Action – the introduction of the conflicts or complications.

Crisis – the point of no return, the moment of choice.

Falling Action – the final or major confrontation.

Dénouement – the resolution of the action of the drama.

This five-stage structural delineation is very applicable to classic and early modern theatre styles, and has a strong relationship to many modern dramas, but the terminology and the fine distinctions between the stages could be alienating in an ESL classroom setting. For the purpose of clearly communicating the key elemental stages, I would suggest using a simplified four-stage structure incorporating the terms *Introduction*, *Action*, *Crisis*, and *Resolution*. Below, I will outline each of these stages in a manner that may be useful in an ESL classroom setting.

Introduction

The introduction is the opening stage of the drama. It is here that setting is established and we meet the central character(s) and learn their needs. In this stage, we may also learn something of the problems (conflicts, complications) that face the central character(s). The introduction is usually a very brief stage, comprising only a scene or two at most.

Action

This stage can be summed up in the phrase ‘something happens.’ In this stage we will be introduced to the larger problems (conflicts, complications) that the characters will encounter. It is here that the character(s) may experience a change in their condition, or embark on a journey. It is also here that the main themes of the drama are developed. New characters may also appear in this stage as well. The action stage can consist of many scenes in many locations, all building the tensions between the various characters in the drama. The action stage is the longest stage of the dramatic structure, usually comprising at least half of the content of the story, and often much more.

Crisis

The crisis stage is the point in the drama where the central character(s) must express and/or work out the major problem(s) (conflicts or complications) of the narrative. It is the point of no return, and very often results in one or more character experiencing a change of condition or nature, sometimes very extreme. As in previous stages, new characters may appear in the crisis stage. This stage is most often brief, consisting of one to a few scenes of high intensity or energy.

Resolution

The resolution is the expression of the result of the crisis, and an indication of what the future may hold. It is most often a brief stage consisting of a scene or two at most. It is possible, but not common, for new characters to appear in the resolution stage. In general, there are two types of resolutions: *dénouement* and *catastrophe*. *Dénouement*, French for ‘untying the knot,’ is most often associated with comedies, and is the stage in the drama where foibles and misconceptions come to light. The end of a comedy is generally expressed as a return to normalcy. The second type of resolution, *catastrophe*, is the ancient Greek term for ‘overturn,’ and is most often associated with tragedies, or serious dramas. In a catastrophic resolution, the world, or at least a character, has experienced a change of great magnitude. They will never be the same again.

These two forms of resolution, *dénouement* and *catastrophe*, are often referred to in

common vernacular as ‘happy’ and ‘sad’ endings, but this simple binary does not allow for the many subtle variations, which can occur in these two forms of resolution. For example, at the end of a tragedy or serious drama, a character that has experienced an intense change of condition might be happy for the newfound insight they have gained. Or, conversely, at the end of a comedy, a character may be embarrassed or angry about the jokes played on him or her during the action of the play. For the purpose elucidating these two types of resolution in terminology appropriate to an ESL classroom setting, I would propose describing these two forms of resolution as ‘*a return to normal*’ (dénouement), and ‘*things have changed*’ (catastrophe).

Conclusion

It is the hope of this author that a clear understanding of the basic elements of drama (*character, plot, and setting*), and the traditional structure of narrative (*introduction, action, crisis, resolution*), will enable instructors to develop curriculum for the incorporation of creative drama projects that will engage and challenge their students. It is further hoped that a greater understanding and facility with these elements will empower students to take bold steps into the rich territory afforded by dramatic activity, where they can confidently approach the work of creating original dramas.

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Twitter as a Professional Learning Tool: Implications for Practice and Further Research

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Abstract

This paper presents the results of research into how Twitter is being employed by educators to support their professional learning. This question was addressed through an exploratory case study, which comprised three phases of data collection and analysis. A content analysis of a sample of blog posts ($n=600$) was undertaken (Phase 1) in order to discover the types of interactions that occur in microblogging. Findings from the content analysis were further explored in Phase 2 with an online survey ($n=121$), which addressed why educators participate in Twitter and the value they place on that participation. Finally, in Phase 3, one-on-one interviews were held with a purposively selected group of educators ($n=9$) in order to further investigate the findings from the online survey and to address the question of how Twitter can support professional learning.

This research uncovered various uses of Twitter to support professional learning and established the value of Twitter within professional learning networks (PLNs). Additionally, it was revealed that the time-efficacy of writing and reading posts of 140 characters makes Twitter an ideal medium for professional learning. Based on the research results, this paper outlines the advantages of Twitter as a professional learning tool and the implications this has for practice and for further research. Best practice methods of introducing Twitter to other educators as a tool to support their professional learning are presented. The paper also addresses a number of questions emerging from the study which warrant further research. The full study can be accessed at eprints.qut.edu.au/65854/

Key Words: microblogging, PLN, professional learning, Twitter

Introduction

For much of the industrialised world, information and communication technology (ICT) is now a ubiquitous tool in the workplace and at home, impacting on personal communication, organisation of activities, information management and learning (Go & van Weert, 2004). Sorensen and Murchú (2006) noted that learning through digital technology is a global reality and that technology in the 21st century is without boundaries, that is, it is not limited by location or time. Reinforcing this notion, the OECD (2005) stated that:

Information and communication technology has the potential to transform the way people work together (by reducing the importance of location), access information (by making vast amounts of information sources instantly available) and interact with others (by facilitating relationships and networks of people from around the world on a regular basis). (p. 11)

The formation of such relationships and networks has been particularly enabled by the emergence of online social networking. Online social networking sites such as Six Degrees, Friendster and MySpace began to appear in 2002 and were initially designed to foster the development of explicit ties between individuals as “friends”. There are a variety of online social networking sites that link individuals virtually and enable rapid exchange of knowledge, high levels of dialogue and collaborative communication through text, audio and video (Siemens, 2006). Microblogging is a form of online social networking that allows users to post short messages of 140 characters or less on the Web and viewing of these messages may be restricted to chosen individuals or made public to anyone with access to the Web. Microblogging is used to communicate actions and projects, to put questions, to ask for directions, support, advice, and to validate open-ended interpretations or ideas (Grosseck & Holotescu, 2008). Some common contemporary microblogging services are Twitter [www.twitter.com] on which this study was based, Plurk [www.plurk.com] and Yammer [www.yammer.com].

Background

The focus of this study was the use of Twitter for self-directed professional learning by educators who wrote their posts in the English language. While individuals with a wide variety of ages and backgrounds participate in Twitter, this study focused on the activities of educators who currently use Twitter. Participants in the study included teachers, teacher educators, school principals, university lecturers and technology support officers. Although each of these types of “educators” work in different educational institutions with different aims, and have different concerns and practices, they have in common that they are involved in the education of others and they have individual professional learning needs. In studying this particular group of individuals and their involvement with Twitter, questions regarding how these individuals related and collaborated were explored.

Professional Learning Networks (PLNs)

Educators, like other professionals, can no longer rely on their original professional training and are required to maintain dynamically changing network connections (Hakkarainen, Palonen, Paavola, & Lehtinen, 2004). Networking is not new to educators, who have networked for many years in order to share practice; valuing contact with colleagues in similar and different settings. What is new, is the fact that the Web can facilitate networking across the world and individuals are personalising their own social networks with the help of the Web (Wellman, Boase, & Chen, 2002). Not only are these online social networks being used for social connections, they also provide tools for personalising learning (Ala-Mutka, 2009) and have the ability to facilitate personal learning networks (PLNs) (Grosseck & Holotescu, 2008).

The concept of learning networks was presented by Illich (1971) when he posed the question, "What kinds of things and people might learners want to be in contact with in order to learn?" (p. 78). Illich noted that information could be stored in things and in people, and that in order to learn, one needs both information and critical response to its use from somebody else. The origin of the term professional (or personal) learning network (PLN) is difficult to ascertain and it is challenging to find a definition for the concept of PLN. The term appears to have been first used by Tobin (1998) who described a PLN as "a group of people who can guide your learning, point you to learning opportunities, answer your questions, and give you the benefit of their own knowledge and experience" (para. 1). More recently, professional learning networks have been variously described in the literature as: a collection of people and resources that guide learning, point one to learning opportunities, answer questions, and give one the benefit of their knowledge and experience (Nielsen, 2008); a place where one creates their own classrooms, curricula and textbooks for study of whatever one is passionate about (Richardson, 2008); a system of interpersonal connections and resources that support informal learning (Trust, 2012); and a technology-supported community of people who help each other better understand certain events and concepts in work or life (Koper, 2009).

It is to be noted that the borders between personal and professional learning networks are blurred (Ivanova, 2009) and PLN is variously used to mean personal or professional learning network in the literature. For the purposes of this study, PLN was taken to mean one's professional learning network.

Twitter

Twitter is a form of online social networking which enables people to share limited information about themselves via their profile and share their activities in short posts of up to 140 characters. Posts are made in response to the general question "What are you doing?" and the answers include messages of context, invitation, social statements, inquiries and answers, news broadcasts and announcements. Many posts are responses to other postings, pointers to online resources that the user found interesting, musings or questions (Educause, 2007). Twitter was launched on July 13, 2006 and allows users to post entries through a website or a mobile device.

The Study

This study examined the use of Twitter for self-directed professional learning amongst educators and investigated the value that educators place on Twitter as a professional learning tool. The study examined how distributed groups support each other and learn together using Twitter.

Significance

The significance of this study lay in its investigation of the use of an online collaborative tool (Twitter) for professional learning purposes. While there is a vast amount of literature relating to the use of computer-mediated conferencing in instructional learning environments, much is still unclear about the use and role of online social networking in general, and Twitter in particular, for professional learning. Millen and Patterson (2002) identified that there was a growing body of research investigating various aspects of online communities but that much of this research has been descriptive and focused on the nature of the social interaction and reported about the various activities of the members and visitors. Several studies have investigated the use of online social networking for the purpose of strengthening a community (Prell, 2003) but there have been few studies into the formation of professional learning networks through online social networking; notable examples of which are Alderton, Brunsell, and Bariexca (2011), Grosseck and Holotescu (2011), Lalonde (2011) and Veletsianos and Kimmons (2013).

Furthermore, in examining online social networks, researchers have been particularly concerned with how people make friends, how many friends they have and the reliance on social networks for social support (Golder, Wilkinson, & Huberman, 2007). Ala-Mutka (2009) noted that there was a lack of awareness of the potential for learning in online networks and advised that educational institutions should acknowledge the important role of these informal online networks and prepare people to take part in them. In relation to research into the use of social networking as a tool to support learning, Alderton, et al. (2011) advised that:

Additional studies looking at how other online learning communities may be used as professional development venues would be beneficial and add to the knowledge base of online learning, professional development, and learning networks. (p. 1)

Methodology

The study employed a qualitative research design in the form of an exploratory case study, which comprised three phases of data collection and analysis. A content analysis of a sample of Twitter posts ($n=600$) was undertaken (Phase 1) in order to discover the types of interactions that occur. Findings from the content analysis were further explored in Phase 2 with an online survey ($n=121$), which addressed why educators participate in Twitter and the value they place on that participation. Finally, in Phase 3, one-on-one interviews were held with a purposively selected group of educators ($n=9$) in order to further investigate the findings from the online survey and to address the question of how Twitter can support professional learning. An overview of data

gathering through three instruments in three sequential phases is illustrated in Figure 1 and further described below.

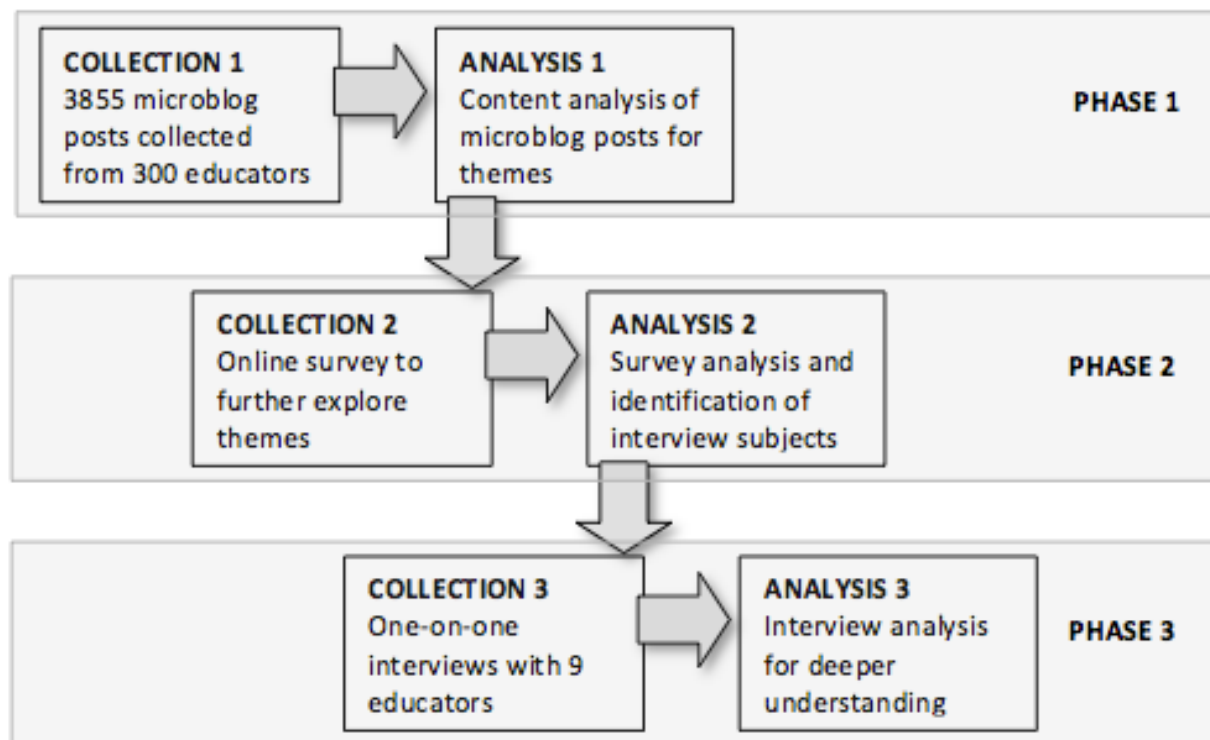


Figure 1: Sequence of data collection and analysis

Phase 1: Content Analysis: designed to discover the types of interactions that occur in Twitter. Twitter posts ($n=3855$) from a 24-hour period were collected and a sample ($n=600$) were analysed to determine the types of messages that were being posted. The *Community of Inquiry* (CoI) framework (Garrison, Anderson, & Archer, 2000) was used to analyse the posts. The CoI framework assumes that learning occurs within the community through the interaction of three core elements, that is, cognitive presence, social presence, teaching presence, which interact to influence and shape educational experiences. Analysis using the CoI framework allowed the researcher to categorise the types of interactions and identify themes, which would be further explored in Phase 2 of the study.

Phase 2: Online survey: designed to discover why educators participate in microblogging and the perceived value of their participation in Twitter. In this study the survey was used as a qualitative research tool for gathering data with the intention of describing the nature of existing conditions (Cohen, Manion, & Morrison, 2007). The survey comprised fourteen questions, which were organised around four themes: demographics, microblog usage, microblog behaviour, and PLN use. From the survey respondents ($n=121$), nine participants were purposively chosen to participate in the third phase of the data gathering, namely, one-on-one interviews.

Phase 3: One-on-one interviews: designed to further investigate how Twitter can support professional learning. The interview subjects ($n=9$) were selected from the pool of survey respondents who had indicated that their PLN was “extremely” important in their overall professional learning ($n=66$); that microblogging was “extremely” important in their PLN ($n=49$); that they considered participation in microblogging to be a meaningful form of professional learning ($n=104$) and they were willing to participate in the interview process ($n=63$). During one-on-one interviews these educators were asked a series of six semi-structured and open-ended questions that were designed to capture their subjective experiences and attitudes towards microblogging. The interview recordings and researcher notes were analysed to determine common themes which had emerged from the content analysis of Twitter posts (Phase 1) and the online survey (Phase 2), and to provide a deeper understanding of why individuals participate in Twitter and the value they perceive in that participation.

Findings

The online survey of educators who use microblogging ($n=121$) revealed that the majority use Twitter ($n=112$, 94.1%), have been using microblogging for 1-3 years ($n=60$, 50.4%) and spend 4-6 hours per week using microblogging ($n=38$, 31.9%). The largest category of respondents ($n=54$, 45.4%) belong to 4-6 social networking communities (including microblogging), while a small number ($n=8$, 6.7%) belong to more than 10 social networking communities.

Twitter Behaviours and Activities

The study revealed that most educators engage in a variety of Twitter behaviours at some time with the most frequent being:

- sharing a resource, for example, a website, book, or video;
- on-sharing a resource posted by someone in their network;
- sharing information from a conference/workshop using a hashtag;
- saving a resource posted by someone in their network;
- going back to a saved resource posted by someone in their network;
- following a link posted by someone in their network;
- using hashtags;
- engaging in a conversation with someone in their network;
- searching for content;
- asking for a resource on a specific topic;
- reading activity updates of others in their network; and
- acting on something they had read in a Twitter post.

Value of Twitter as a Professional Learning Tool

Participants in the study identified several advantages of using Twitter as a professional learning tool. The themes that emerged were:

- access to timely information;
- making diverse and global connections;
- access to valuable resources;
- access to advice and support;
- ability to attend a conference “virtually” by following the hashtags posted by others;
- engaging in conversations and discussions;
- access to experts;
- keeping up with current trends;
- extending their networks beyond their local area;
- reciprocity; and
- learning.

Although the participants in this study were enthusiastic about Twitter and believed that it contributed to their professional learning and positively impacted on their teaching practice, they described some disadvantages. The problem common to all educators in this study was the large amount of information they received from others in their Twitter network. It was found that some educators had effective strategies for dealing with this, while others did not. Another disadvantage noted was the amount of time spent posting. Two educators who had been using Twitter for less than three years, used the word “addictive” and said that they felt they had to constantly check their Twitter streams in case they missed valuable information.

Implications for Practice

This study showed that Twitter could be a valuable tool for professional learning; therefore, it is desirable that effective ways are employed for introducing it to educators in general. The first hurdle to be overcome is the common perception of Twitter as a stream of unremitting triviality about what you are making or eating for dinner (McFedries, 2007). Once an educator overcomes this perception and decides to join Twitter, they need to know how to open an account and start building their network. Effective professional learning through Twitter involves participating in the network by sharing resources and information, and engaging in dialogue with other educators. If new members do not know how to go about finding relevant educators with whom to link, their dialogue will fall short of expectations and they will not find Twitter an effective professional learning tool.

Brown, Collins and Duguid, (1989) cautioned against adopting tools without adopting their culture and advised that a new user must enter a community and its culture with care. Additionally, although Twitter provides opportunities for learning, not all individuals are equipped with the skills or knowledge to benefit from these learning opportunities (Ala-Mutka, Punie, & Ferrari, 2009). In order to participate in Twitter there is certain knowledge and understanding of conventions required that, while obvious to experienced users, may not be known to new or intending users. I advise that educators are introduced to Twitter by an

experienced user, who constructs a learning scenario in which they can participate. New users need to be immersed in the sharing of ideas and discussion from the outset. A common practice of experienced Twitter users is to expose new users to the network, in general, or to specific educators that they think the new user would find valuable. This is done either by retweeting a post made by the new user, thus exposing them to the network of the experienced Twitter user, or by introducing educators to one another directly.

Once an educator begins using Twitter to support their professional learning, there are still pitfalls to be considered. Drexler (2010) warned that the learning potential exists in a PLN in what the learner does with the compilation of content and how it is synthesized. The educators in this study reported that the amount of information exchanged within their network could be problematic, and they did not all have effective techniques for dealing with it. It appears, from the descriptions of interview subjects, that the most effective way of dealing with these large amounts of information is to save it to another application and tag it so that it can easily be searched at a later date. This technique should be introduced to educators when they begin using Twitter to ensure that they are effectively managing the information they receive from their expanding network.

Another implication for practice comes from the issue of recognition of microblogging as a legitimate form of professional learning. Several educators related that using Twitter was a significant part of their informal professional learning, and despite evidencing this by documenting that learning reflectively, for example in a blog, this was not accepted by employers as legitimate professional learning. Twitter represents a significant shift in pedagogic approach, and should be seen as a completely new form of communication that can support informal learning beyond classrooms (Ebner, Lienhardt, Rohs, & Meyer, 2010). It is important that institutions understand that knowledge is distributed through different communities (and networks) and, central to such an understanding is placing control of learning in the hands of learners themselves and providing learners with the skills and competences to manage their own learning (Attwell, 2006). However, it may be some time before Twitter is accepted universally as a legitimate professional learning tool.

Implications for Further Research

While caution needs to be exercised in generalising the findings of this study, the outcomes may be used to guide further research in this area. The study uncovered various uses of Twitter to support professional learning and established the value of Twitter within PLNs. However, it also raises a number of questions which researchers may wish to explore in future studies.

1. The data revealed that the more experienced Twitter users behaved differently from educators who were new to Twitter. The question arises as to whether this is a sequential path along which all Twitter users move and if there is any benefit in accelerating new users along this path.
2. It was found that participants believed they were learning through Twitter and that this learning was evident in their practice. This is an area that warrants further investigation in order to ascertain a stronger link between Twitter, learning and evolving practice. Alderton et, al. (2011) also suggested this type of study in order to understand how learning in professional networks is transferred into practice.

3. As noted, the phenomenon explored by this study involved a specific technology (Twitter) being used by a specific group of people (educators) for a specific purpose (professional learning). It would be beneficial to conduct comparative research in other professions to investigate if the use of Twitter for professional learning was widespread in professions beyond education and, if so, how and why it was used.
4. Finally, it is recognised that a precondition for successful adoption of a technology tool is a positive attitude towards its potential (Honeycutt & Herring, 2009). The participants in this study had a positive attitude towards Twitter and could be considered early adopters. Further research into the attitudes of non-users and why they are not using Twitter for professional learning would be useful.

Conclusion

The study showed that educators who participate in Twitter consider it to be a meaningful form of professional learning and that access to information, resources, advice and support from a diverse global network was highly valued and enriched their learning experiences. The inclusion of Twitter in a PLN gives educators access to resources and information exchanges with other educators that they would not otherwise have. The ability to engage in dialogue with peers and experts outside their geographic area allowed these educators to seek advice and support from others with a wide range of experience and knowledge, and thus extend their thinking. Given the findings of this study, more research is needed to expand the understanding and use of Twitter as a professional learning tool.

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A Webometric Analysis of Some Universities in Lebanon

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Abstract

One way to rank universities nowadays is through running Webometrics on a university's website. Webometrics measure the overall web presence of websites using various indicators. One way of improving the ranking of a university is to keep measuring its web presence and taking corrective actions based on an analysis of the results. In this paper, an analytical study of twenty-four university websites in Lebanon is conducted. Ranking the universities web sites based on two webometric ranking methods (Web Impact Factor (WIF) and Web Indicators of Science, Innovation and Research (WISER)) is presented. WIF and WISER are based on different webometric indicators such as visibility (external links), size (webpages), rich files and scholar (academic papers). The study was conducted over three years 2011, 2012 and 2013 using several search engines. Based on the collected data and its analysis, an automated ranking and recommendation system was designed and implemented. The main goal of this system was to reduce the time needed for each university webmaster to rank the website. Another goal was to generate automated recommendations to help a university improve its rank and fix problems that it faces in its website. In the paper, it is shown that the correlation between WIF and WISER is negative and it is recommended not to use WIF because of its limitations; whereas WISER is more flexible and promotes research and publications.

Key Words: Webometric, WIF, WISER, Ranking Universities Websites.

INTRODUCTION

The World Wide Web is an important method by which information can be published across the globe. Academic websites are the main showcase for universities. They are used to introduce the world to the universities' programs, faculties, facilities, achievements, etc... They constitute a very important tool that helps students in choosing their future university.

Ranking has always attracted the attention of people, companies and institutions. It focuses on the aspects which are important in achieving the first place. Ranking universities' websites gained more importance in recent years due to the increase in the competition among universities to attract top students who are searching for a suitable university. Thus, achieving advantageous visibility on the web will improve their website ranking.

There are no studies in the literature that provide a webometric analysis for Lebanese Universities' websites. In this paper an analysis for these websites is done according to two different ranking approaches. One of these approaches is the web impact factor (WIF) which is the web version of the impact factor that reflects the total size of a website as well as the quality of information provided by the site, it was developed by Ingwersen (1998). It focuses on two indicators: number of Web Pages in a website and the number of External Links it receives. The second approach is the Web Indicators for Science, Innovation and Research (WISER) (Ranking Web of Universities, 2011, 2012 & 2013). WISER has more indicators than WIF: number of Web Pages in a website, number of External Links it receives (this indicator was adjusted in years 2012 and 2013 to include the number of referring domains originating those links), the total number of academic files (rich files) and the total number of highly cited research papers (scholars) published on the website. The web presence can be measured with the help of search engine's advanced facilities. The webometric data used in this study have been collected using Yahoo, Google, AltaVista, Ahrefs and Majestic SEO search engines using special query syntax.

In section 2, we review existing literature where the authors ranked institutions' websites in various countries. In section 3, we present the objectives of our work followed by the methodology in section 4. Section 5 describes the ranking methods (WIF and WISER) used and the evolution of the WISER formula and the definition of its indicators over three years 2011 to 2013. Section 6 shows the ranking of the Lebanese universities over the three years; section 7 computes the correlation between WIF and WISER for the data collected; and section 8 presents the results extracted from the data collected on Lebanese universities. In section 9, we describe the automated ranking and recommendation system that we built and we conclude the paper in section 10.

LITERATURE REVIEW

Jeyshankar, and Babu (2009), ranked the universities websites in Tamil Nadu in India according to the WIF method. The study showed that some of the universities websites had a large number of web pages, however; their few inlinks kept them with a very low WIF ranking. Samir et al. (2010) analyzed the web presence and visibility of the Asian Countries websites. This research shed some light on hyperlinks studies that reflect the present status of the countries and their relative positions. Another study done by Vijayakumar, Kannappanavar, and Santosh Kumar (2012) focused on the identification of web presence and links among South Asian Countries. Islam and Alam (2011) analyzed the websites of private universities in Bangladesh according to webometric indicators, the study revealed that some universities had high numbers of web pages but their very few numbers of links lowered their ranking. Jalal, Biswas, and Mukhopadhyay (2009) made an

analytical study for the Central Universities in India and ranked their website according to the webometric indicators. The results showed that Indian universities in general had a good web presence; however there were many universities that had a very low number of web pages and thus were not qualified for comparative webometric studies. Also Jalal, Biswas, and Mukhopadhyay (2010a & 2010b) investigated the effectiveness and relevance of web impact factor for Indian Universities' websites. The study noted that even though WIF had been used as webometric indicator, it reflected unreliable results. A webometric analysis of Iranian Universities of Medical Sciences done by Aminpour, Kabiri, Otroj, and Keshtkar (2009) showed that universities websites with high numbers of webpages and external links ranked in last places while other universities with only a few web pages and external links ranked in top places for WIF ranking. Elgohary (2008) analyzed the websites of Arab universities by applying a webometric study; the results showed that Jordanian universities represented 40% of the top ten universities with external WIF while that was not the case in terms of web presence; the results also showed a strong correlation between external links and web presence. Noruzi (2006) made a critical review of WIF and its associated indicators. In his work, he suggested using the WIF as a way of comparing the attractiveness of web sites or domains on the web. Shekofteh, Shahbodaghi, Sajjadi, and Jambarsang (2010) investigated the WIF of Medical Universities in Iran. The results of this study implied that the universities had to pay more attention to the webometric issues and must also allocate more funding to enhance their web pages. Thanuskodi (2013) worked on the websites of some Institutes, which is of national importance in India. The study showed that only a few websites were up to date and that webometric techniques are in their early phases.

OBJECTIVES

The objectives of this paper were to identify websites of some Lebanese universities, collect data about these websites and analyze the collected data according to webometric indicators. Suitable rankings of these websites according to different ranking approaches (WIF and WISER) were found. The correlation between WIF and WISER ranking approaches for the case of the Lebanese universities websites was studied and an automated ranking and recommendation system was designed and implemented. The main goal of this system was to reduce the time needed for each university webmaster to rank the website. Another goal was to generate automated recommendations to help a university improve its rank and fix problems that it faces on its website.

METHODOLOGY

Selection of Universities

The universities included in this analysis were selected in 2010 from the list of universities posted on the Lebanese Higher Education website (Lebanese Higher Education website, 2010). Those universities with non-static websites were chosen.

Data Collection

The data were collected on three different occasions. The first one was on June 25th 2011 and the second was on February 25th 2012 while the third date was on November 2 and 3rd 2013. In the first collection Yahoo, AltaVista and Google search engines were used to collect data. The first two search engines were used to collect the number of web pages and the external links; while Google

was used to find the number of rich files and Google Scholar was used to find the number of scholars. In 2012, we used Google to collect the number of web pages and the rich files and Google Scholar for the scholars while Majestic SEO was used to collect the referring domains and external links. In 2013, we used the same search engines as 2012 in addition to Ahrefs that is also used to find the referring domains and external links. The syntax used to collect data is shown in Table 1.

Table 1 Search engines queries

Search Command	Results	Supported by
domain:abc	Total number of webpages	Google, AltaVista, Yahoo!
site:abc	Total number of webpages	Google, AltaVista, Yahoo
linkdomain:abc – domain:abc	Total number of inlinks	AltaVista, Yahoo!
Linkdomain:abc	Total number of links	Yahoo, AltaVista
Filetype:.x	Total number of files of type x in the web	Google

CLASSIFICATION METHODS

Web impact factor (WIF)

Several studies showed that websites can be compared and ranked in different domains based on their web impact factor which reflects the website's global frame as well as the quality of information resources it provides. Almind and Ingwersen (1997) proposed the first Web indicator, Web Impact Factor (WIF), based on link analysis that combines the number of external inlinks received by a website and the number of pages of the website, a ratio of 1:1 between visibility and size.

An inlink is a link that a web page receives from other web pages. It can be internal or external. The external inlink is a link received from an outsider website, while internal inlink is received from pages in the same website.

$$WIF_{external} = \frac{\text{Number of external inlinks the website receives}}{\text{Number of webpages indexed from the same website}}$$

Web Indicators for Science, Innovation and Research (WISER)

University activity is multi-dimensional and this is reflected in its web presence. For calculating its ranking a group of indicators must be combined to produce the most accurate result. In addition to the indicators already used by WIF, which are the number of external inlinks received by a website and the number of pages in it, WISER uses two new indicators: The number of academically useful documents, measured as the number of rich files in a web domain and the number of highly cited publications. The four indicators were obtained from the quantitative results provided by the main search engines as follows. Each indicator for each university was computed by one, two or three search engines depending on the indicator and on the year studied. Then for each engine, these numbers were log normalized to the highest value. If only one search engine is used, then there is one log normalized value found for this indicator for each university. If two search engines are used, then the highest log normalized value for each university is used. If three search engines are used, then the median log normalized value for each university is used. Those normalized values are sorted and a rank for this indicator is given to the web site of the corresponding university.

Size (S): The number of webpages of each university was computed by AltaVista, Yahoo and Google. For each engine, results are log-normalised to 1 for the highest value. Then for each domain, the median log-normalised value is used to give each institution a rank according to this value. For example, let $W_{A,i}$, $W_{Y,i}$ and $W_{G,i}$ be the number of webpages of university i collected by AltaVista, Yahoo and Google respectively. Let $W_{A,MAX}$ ($W_{Y,MAX}$, $W_{G,MAX}$) be the maximum number of webpages found by Alta Vista (Yahoo, Google) for all universities.

$$W_{A,MAX} = \text{maximum}(W_{A,i}), i = 1 \text{ to } 24$$

Let $NW_{A,i}$ be the number of webpages of university i collected by AltaVista log normalized to $W_{A,MAX}$.

$$NW_{A,i} = \frac{\log(W_{A,i} + 1)}{\log(W_{A,MAX} + 1)}; \quad NW_{Y,i} = \frac{\log(W_{Y,i} + 1)}{\log(W_{Y,MAX} + 1)}; \quad NW_{G,i} = \frac{\log(W_{G,i} + 1)}{\log(W_{G,MAX} + 1)}$$

For each university, the highest and lowest log values were excluded. The remaining log values NW_i ($i = 1$ to 24) are sorted in decreasing order and ranks are assigned to each website (rank 1 to the highest log value). This rank is used in the WISER formula.

Visibility (V): The total number of unique external links received (inlinks) by a site can be obtained from Yahoo Search, and AltaVista. For each engine, results are log-normalized to 1 for the highest value and then combined to generate the rank in the same way described before.

Rich Files (R): After evaluation of their relevance to academic and publication activities and considering the volume of the different file formats, the following were selected: Adobe Acrobat (.pdf), Adobe PostScript (.ps, .eps), Microsoft Word (.doc, .docx) and Microsoft Powerpoint (.ppt, .pptx). These data were extracted using Google. The results for each file type were merged after log normalisation.

Scholar (Sc): Google Scholar provides the number of papers, reports and citations for each academic domain.

For year 2011, the four ranks were combined according to the following formula, where each one has a different weight:

$$WISER \text{ formula} = 0.5 * Rank(V) + 0.2 * Rank(S) + 0.15 * Rank(R) + 0.15 * Rank(Sc)$$

In 2012, changes in the methodology were made concerning the sources of collecting data and the weights of indicators. The Size and Rich Files data were collected from Google and the weight of each indicator in WISER formula was 10%. Scholar data were collected from Google Scholar, and the corresponding weight in WISER formula was 30%. The Visibility data were collected from Majestic SEO and the corresponding weight in WISER formula was 50%. The Visibility indicator's definition changed from being the number of external links in 2011 to the product of the external links and referring domains originating those links. The WISER formula for year 2012 was:

$$WISER \text{ Formula} = 0.5 * Rank(V) + 0.1 * Rank(S) + 0.1 * Rank(R) + 0.3 * Rank(Sc)$$

For 2013, the data was collected in the same way as in 2012, but for Visibility indicator the values were collected from two search engines, and the highest log-normalized value for each university was considered for ranking the visibility indicator. The weight of the Size, Rich Files and Scholar indicators were equal and represent 50% of the overall rank. The WISER method for year 2013 was:

$$WISER Formula = 0.5 * Rank(V) + 0.5 * ((1/3 * Rank(S)) + (1/3 * Rank(R)) + (1/3 * Rank(Sc)))$$

Table 2 lists the indicators of the WISER formula and the corresponding source, weight and definition over the years 2011, 2012 and 2013.

Table 2 Changes in the WISER formula over three years

Year	Indicator	Source	Weight	Meaning
2011	Visibility	AltaVista, Yahoo	50%	External links (inlinks received by the site)
	Size	Google, AltaVista, Yahoo	20%	Webpages
	Rich Files	Google	15%	Number of files (pdf, doc, ppt and ps)
	Scholar	Google Scholar	15%	Publications
2012	Visibility	Majestic SEO	50%	External links × Referring domains
	Size	Google	10%	Webpages
	Rich Files	Google	10%	Number of files (pdf, docx, doc, pptx, ppt, ps and eps)
	Scholar	Google Scholar	30%	Publications
2013	Visibility	Majestic SEO, Ahrefs	50%	$\sqrt{\text{External links} \times \text{Referring domains}}$
	Size	Google	1/6	Webpages
	Rich Files	Google	1/6	Number of files (pdf, docx, doc, pptx, ppt, ps and eps)
	Scholar	Google Scholar	1/6	Publications (the university output being part of the 10% most cited papers in their fields)

RANKING OF LEBANESE UNIVERSITIES

The study was applied on 24 Lebanese universities, 23 private and 1 public. The data was collected for three consecutive years. The first time on June 2011 using 3 search engines. The final ranking results for the Lebanese universities using WIF and WISER are shown in Table 3. The results showed that the American University of Beirut (AUB) ranked 1st in WISER while it ranked 22nd according to WIF. Saint Joseph University (USJ) came in second place in WISER while it ranked in 23rd position in WIF. On the other hand, the Lebanese German University (LGU) with only 105 webpages and 547 external links ranked 1st in WIF while it ranked in 18th position according to WISER.

Table 3 Ranking of Lebanese universities according to WIF and WISER in June 2011

University Name	Webpages	External links	Rich Files				scholar	WISER Ranking	WIF Ranking
			pdf	doc+ docx	ppt+ pptx	ps+ eps			
American University of Beirut	65,719	25,544	15,900	1,380	258	60	2,120	1	22
Saint Joseph University	52,807	15,378	6,400	533	26	0	39	2	23
Lebanese American University	15,342	7,195	2,090	545	4	0	128	3	20
University of Balamand	5,568	9,697	701	9	3	0	3	4	8
Notre Dame University	3,236	2,581	1,260	14	0	0	29	5	17
Lebanese University	2,288	2,343	410	194	2	0	3	6	14
Beirut Arab University	24,087	2,175	257	4	0	0	1	7	24
Holy Spirit University	1,617	1,639	345	8	13	0	1	8	15
Haigazian University	984	1,547	196	4	0	0	0	9	11
Antonine University	1,940	782	74	2	0	0	0	10	21
Jinan University	940	683	158	57	0	0	3	11	18
Lebanese International University	489	836	92	0	0	0	0	12	9
American University of Science and Technology	216	693	190	3	2	0	0	13	3
Global University	309	428	411	4	1	0	0	14	12
The Islamic University of Lebanon	306	509	72	6	0	0	0	15	10
Modern University of Business and Science	273	541	7	0	0	0	0	16	5
Hariri Canadian University xxx	524	352	176	22	0	0	1	17	19
Lebanese German University	105	545	3	0	0	0	0	18	1
University of Sagesse	237	476	57	1	0	0	0	19	4
Middle East University	275	366	0	0	0	0	0	20	13
Arab Open University	157	292	587	6	2	0	16	21	7
Almanar University	194	354	0	0	0	0	0	22	6
Arts, Sciences & Technology University of Lebanon	253	246	5	0	0	0	0	23	16
Lebanese Canadian University	66	266	1	0	0	0	0	24	2

According to the data collected on February 2012, the values of the indicators and the source used to collect these indicators were changed based on the new methodology. The final ranking results for the Lebanese universities in February 2012 using WIF and WISER are shown in Table 4.

Table 4: Ranking of Lebanese Universities Websites according to WIF and the new WISER ranking in Feb. 2012

University Name	Webpages	Referring domains	External links	Rich Files				Scholars	WISER Rank	WIF Rank
				pdf	doc, docx	ppt, pptx	ps, eps			
American University of Beirut	205,000	22,770	310,814	25,700	2,182	1,539	64	2,340	1	17
Saint Joseph University	337,000	11,548	4,023,668	6,650	568	30	0	52	2	5
Lebanese American University	80,500	22,030	267,226	2,540	347	8	0	560	3	14
University of Balamand	35,600	7,348	61,335	2100	23	5	0	3	4	16
Lebanese University	200,000	5,846	30,580	852	336	2	0	3	5	22
Notre Dame University	5,710	5,652	36,951	1,200	23	0	0	37	6	10
Beirut Arab University	5,740	6,287	27,726	312	6	0	0	1	7	12
Holy Spirit University	7,990	2,631	23,614	603	15	16	0	2	8	15
Haigazian University	1,710	4,763	21,440	292	6	0	0	3	9	4
Lebanese International University	17,700	2,980	13,785	96	0	0	0	1	10	21
Jinan University	1,410	1,750	15,762	185	46	0	0	3	11	6
Modern University for Business and Science	522	3,274	19,418	12	1	0	0	0	12	2
Hariri Canadian University	7,610	1,627	7,326	265	26	0	0	3	13	19
American University of Science and Technology	7,530	1,851	8,896	207	3	1	0	0	14	18
Global University	1,200	1,431	8,805	439	4	0	0	0	15	9
Antonine University	7,890	1,398	6,432	103	7	0	0	0	16	20
The Islamic University of Lebanon	342	772	11,275	75	6	0	0	0	17	3
Arab Open University	633	278	2,582	576	3	0	0	20	18	13
Middle East University	1,150	1,109	6,762	0	0	0	0	0	19	11
Arts, Sciences & Technology University in Lebanon	78,200	237	863	7	0	0	0	0	20	24
University of Sagesse	2	259	6,272	0	0	0	0	1	21	1
Almanar University	591	326	4,858	3	1	0	0	0	22	8
Lebanese German University	25,300	151	875	7	1	0	0	0	23	23
Lebanese Canadian University	58	60	576	1	0	0	0	0	24	7



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The results showed that AUB ranked 1st in WISER ranking while it ranked 17th according to WIF ranking. USJ came second in WISER while ranked 5th according to WIF ranking. On the other hand, the University of Sagesse ranked first with respect to WIF with only 2 webpages and 6,272 external links, and ranked 21st according to WISER.

For year 2013, after applying the WISER method, AUB ranked 1st with 116,187 external links and 990,000 webpages and the Lebanese Canadian University (LCU) ranked last with 111 external links and 865 webpages. According to WIF, the Lebanese International University (LIU) ranked 1st with 53,901 external links and only 647 webpages, while the Lebanese University ranked last with 67,740 external links and 975,000 webpages. Table 5 shows the analyzed websites of the universities in Lebanon, their indicators values and their WIF and WISER rankings.

CORRELATION BETWEEN RANKINGS OF WIF AND WISER

The results in the previous section showed that there is a huge difference between the WIF and WISER rankings for the same university. In this section, we will try to study the correlation between the WIF and WISER ranking based on the data collected on June 2011, February 2012 and November 2013.

It is known that the correlation coefficient relates the strength and direction of linear relationship between two variables. The correlation is calculated according to the following formula:

$$r = \frac{\sum XY - \frac{\sum X \sum Y}{N}}{\left(\sqrt{\sum X^2 - \frac{(\sum X)^2}{N}} \right) \left(\sqrt{\sum Y^2 - \frac{(\sum Y)^2}{N}} \right)}$$

Assume that the variable X represents the WISER ranking of the universities, variable Y represents the WIF ranking and variable r represents the correlation coefficient. The following is the calculation of the correlation coefficient between X and Y based on the data collected in June 2011:

$$\begin{aligned} \sum XY &= 3041, \sum X = \sum Y = 300, N = 24, \\ r &= \frac{3041 - \frac{300 \times 300}{24}}{\left(\sqrt{4900 - \frac{90000}{24}} \right) \left(\sqrt{4900 - \frac{90000}{24}} \right)} \end{aligned}$$

Therefore the calculated r is -0.616. The calculated correlation between WISER and WIF methods for data collected in 2011 was negative, which means that the relation between two methods is inverse.

For data collected in February 2012, the correlation coefficient was found to be $r = -0.07$. The value of the calculated correlation coefficient shows that there is a very low correlation between the WIF and WISER ranking according to the February 2012 ranking for the Lebanese universities websites.

For year 2013, the correlation value was $r = -0.174$. Therefore, there was a negative correlation between WIF and WISER; the two methods are inversely related.

Table 5: Ranking of Lebanese universities according to WIF and the new WISER ranking in Nov. 2013

University Name	Webpages	External Links	Referring Domains	Rich Files				Scholar	WISER	WIF
				pdf	doc, docx	ppt, pptx	ps, eps			
American University of Beirut	990,000	116,187	5,233	27,500	1,276	235	63	2,510	1	23
Saint Joseph University	264,000	4,196,551	12,540	9,300	724	71	0	86	2	6
Lebanese American University	64,700	317,389	21,961	3,660	214	18	0	616	3	16
Lebanese University	975,000	67,740	5,894	2,290	564	10	0	45	4	24
University of Balamand	54,500	140,576	6,944	1,330	10	2	0	3	5	20
Holy Spirit University	44,900	34,091	711	1,520	18	15	0	3	6	19
Notre Dame University	7,350	61,427	5,741	2,050	26	0	0	37	7	11
Beirut Arab University	2,670	113,447	6,029	594	7	0	0	1	8	15
Haigazian University	7,090	50,721	4,543	475	13	0	0	3	9	14
Antonine University	13,400	50,100	1,331	143	8	0	0	0	10	17
Jinan University	1,950	25,989	1,550	303	56	0	0	3	11	9
Lebanese International University	647	53,901	3,086	294	0	0	0	1	12	1
Modern University for Business and Science	1,220	21,788	3,497	29	1	0	0	0	13	5
American University of Science and Technology	1,990	18,735	1,890	142	3	1	0	0	14	10
Global University	1330	27,352	1,145	469	2	0	0	0	15	3
Arab Open University	644	9,006	96	572	4	3	0	20	16	8
University of Sagesse	2,030	31,832	407	164	5	1	0	1	17	7
The Islamic University of Lebanon	394	22,959	878	89	13	0	0	0	18	2
Lebanese German University	23,700	9,103	59	33	1	0	0	0	19	21
Middle East University	2050	14,910	898	1	0	0	0	0	20	13
Rafik Hariri University	1,570	539	26	412	223	0	0	4	21	22
Almanar University	1020	19,303	492	76	0	0	0	0	22	4
Arts, Sciences & Technology University in Lebanon	826	1,949	378	36	0	0	0	0	23	18
Lebanese Canadian University	111	865	71	26	0	0	0	0	24	12

RESULTS

After analyzing the indicators of all university websites, we remark that the universities in Lebanon have good web presence in general. The study showed a remarkable progress in web presence between June 2011 and November 2013.

Some Lebanese Universities such as: Almanar University, American University of Science and Technology (AUST), Antonine University, Arts, Sciences & Technology University in Lebanon (AUL), Global University (GL), LCU, LGU, Middle East University (MEU), Modern University for Business and Science (MUBS) and the Islamic University of Lebanon have no Scholar during the ranking dates. Other universities like Beirut Arab University (BAU), Al Jinan University and University of Balamand have Scholars but these Scholars, are low and didn't improve during the three years. AUB, Lebanese American University (LAU), Lebanese University, Notre Dame University (NDU) and USJ Scholars had great improvement over the three years. The remaining universities like Arab Open University, Haigazian, Holy Spirit University (USEK), LIU, Rafic Hariri University (RHU) and University of Sagesse also improved their Scholars but not with high values.

Most universities have a good number of Rich Files and this indicator increased over the three years for all universities except for University of Sagesse that had a decrease in most of its indicators in 2012. This may be due to the change to the website that was taking place at that time. Even with great increase in Rich Files values for most of the universities, there are some universities like MEU, AL Manar University, AUL, LCU and LIU that had only PDF type.

The Rich Files indicator improved for most of the universities as well as the number of webpages. On the other hand, the external links to these webpages also increased. This means that the content of these webpages was also improved. The Scholar indicator increased over the three years, but this increase is less than that of the other indicators.

It is important to note here that in WIF ranks for year 2012 University of Sagesse ranked 1st with only 2 webpages. USJ has the highest external links for year 2012 and 2013. AUB has the highest number of Rich Files and Scholars over the three years. For webpages values, AUB and USJ were always above the mean over the three years. For external links values, AUB, LAU and USJ were above the mean in 2011 and 2012, while in 2013, only LAU and USJ were above the mean. For Scholar values, AUB and LAU were always above the mean over the three years. For Rich Files values, AUB, LAU and USJ were always above the mean over the three years. AUB, LAU and USJ were the only universities above the means of the indicators over the three years and they ranked in the top three over the three years.

The correlation between the WIF and WISER ranking in 2011 and 2013 remained negative. This means that there is an inverse relation between them. In 2012 the correlation was slightly negative this means that there is no relation between them in that year. In some studies, the WISER and WIF methods were not related to each other. In this study the correlation was always negative which means that the data collected from universities websites led to this value rather than the difference in the two methods. The correlation between years 2011 and 2013 remained negative and decreased from -0.616 to -0.174. We can conclude here that the universities are now improving their indicators values as well as the content of their websites. This explains the decrease in the negative correlation value between WIF and WISER, and verifies that the correlation value is due to the data more than the methods. WISER and WIF rank for a university could be improved together if the number of external links of this university increased. If the number of webpages increased this will increase the WISER rank and may affect the WIF rank negatively.

AUTOMATED RANKING AND RECOMMENDATION SYSTEM

The main goals of the automated ranking system that we developed is to rank automatically all the universities websites in Lebanon and to generate automated recommendations that would help improving every university's rank. It is implemented using ASP.net and SQL database.

This system allows each university's web-master to rank the universities websites whenever any changes take place. Then recommendations will be given to help the webmaster improve some indicators value of his university's website which should help in improving its rank. The recommendations are given after comparing the rank of each indicator of the requested university with the above-ranked university's indicator. It then suggests a minimum value of this indicator to reach that of the above ranked university in addition to a list of suggested changes that can help the webmaster achieve the desired indicator's value.

Figures 1 and 2 below are snapshots of the system developed taken in April 2014. They show the WISER ranking of the twenty four universities and the recommendations given to Beirut Arab University to improve its WISER rank.

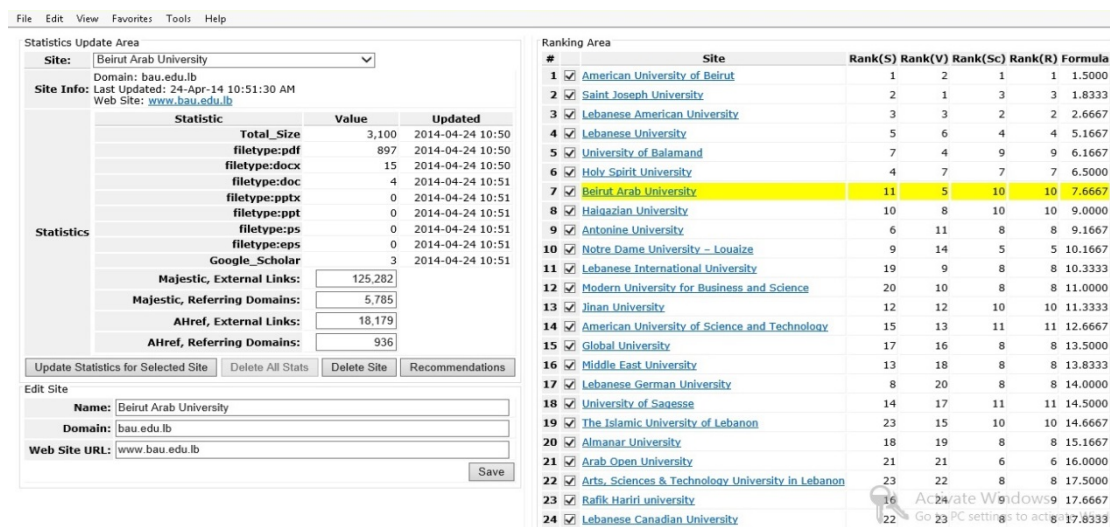


Figure 1: Final WISER ranks

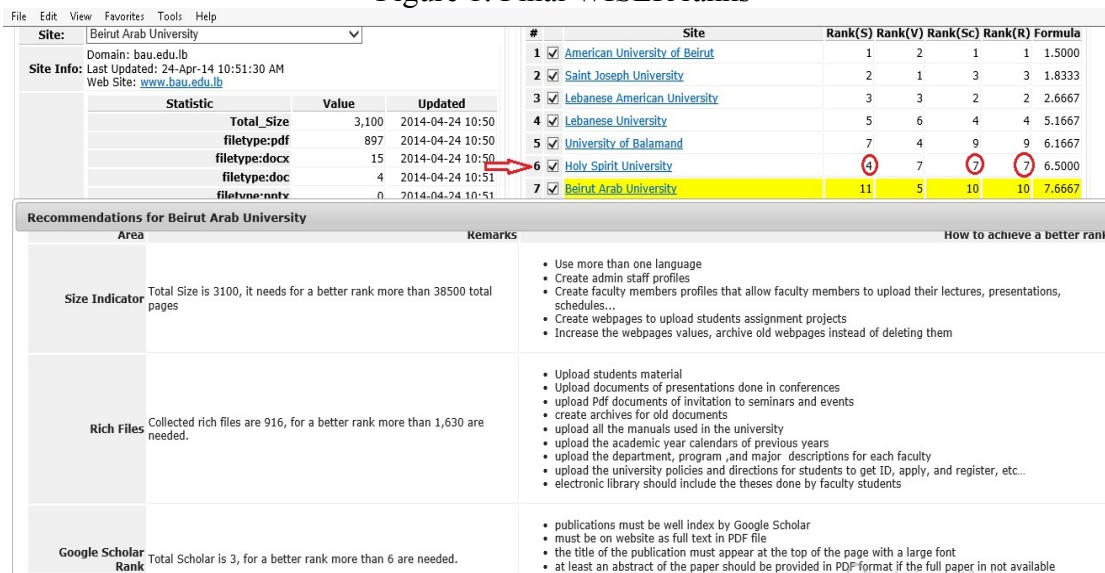


Figure 2: Recommendations for BAU to improve values of its indicators

The system consists of five components shown in Figure 3. These are the User Interface, the Search Engines, the Ranking module, the Database and the Recommendations module.

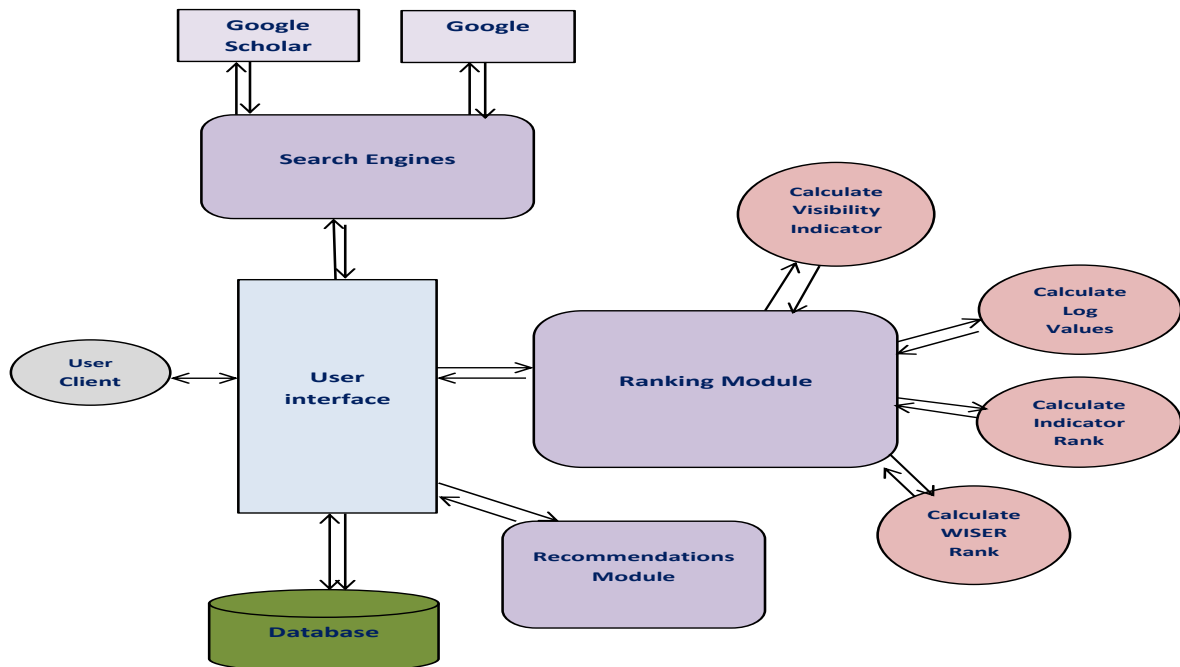


Figure 3: The five components of the Automated Ranking and Recommendation System

The user interface component is responsible for adding a new university and updating or deleting an existing one. It is used to enter the external links and referring domains collected manually using Majestic SEO and Ahrefs Search Engines. It can send an HTTP request to the Search Engine component to get the values of each indicator; it can also send a request to the Ranking module to apply the ranking method on the retrieved data. The rank of each indicator as well as the final WISER rank will be displayed on the user interface. The recommendations to improve each indicator are also displayed by this component.

The search engines component gets the values of Size, Rich Files and Scholar indicators from the Google and Google Scholar search engines after sending query containing the domain. These values are sent to the User interface and saved in the database.

The ranking module calculates the rank of each indicator as well as the final rank of the university. It consists of four subcomponents:

- Calculate Visibility Indicator: multiplies the external links entered by the user with the referring domains.
- Calculate Log Values: calculates the log normalized value of each indicator and chooses the highest log value for visibility.
- Calculate Indicator Rank: ranks each indicator for the universities.

- Calculate WISER Rank: calculates the final rank for each university by applying the WISER formula.

The database module saves the data entered by the user which include the university's name, domain and URL in addition to Majestic SEO and Ahrefs External Links and Referring Domains. It also stores the data retrieved from the search engines that include the number of webpages, the number of scholars and the number of rich files of each type.

The recommendations module allows the user to get some recommendations for a certain university according to its indicators' values, which can be used to improve its rank. The recommendations are given after comparing the rank of each indicator of the requested university with the above ranked university indicators. It recommends that the university should increase the values of certain indicators to reach those of the above ranked university.

CONCLUSION

In this paper, an analytical study of twenty-four university websites in Lebanon was presented. The study was conducted over three years 2011, 2012 and 2013 using several search engines. Based on the collected data and its analysis, the universities' websites were ranked based on two webometric ranking methods Web Impact Factor (WIF) and Web Indicators of Science, Innovation and Research (WISER). Furthermore, an automated ranking and recommendation system was designed and implemented. The main goal of this system was to reduce the time needed for each university webmaster to rank the website. Another goal was to generate automated recommendations to help a university improve its rank and fix problems that it faces in its website.

Lebanese universities made remarkable progress in developing their websites between June 2011 and November 2013. The study shed some lights on the effective indicators used in ranking the websites. The results of the study could be a guide for universities to work on their weak indicators in order to improve their ranking.

According to the ranking made over three years, the calculated correlation between the two methods WIF and WISER was negative and thus they were inverse to each other. The WIF ranking approach, which was calculated by dividing the external links of a website by the number of web pages, could be falsely high for universities with few web pages such as university of Sagesse in year 2012. It is recommended not to use WIF because of its limitations; whereas WISER is more flexible and promotes research and publications.

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