2020

Employing Social Learning Analytic Methods (SLAMs) to Reimagine the Social Dynamic of Online Learning Collaborations

Damien Sanchez  
*University of New Mexico*

Nick Flor  
*University of New Mexico*

Charlotte Nirmalani Gunawardena  
*University of New Mexico*, lani@unm.edu

Follow this and additional works at: https://digitalrepository.unm.edu/ulls_fsp

Part of the Online and Distance Education Commons

**Recommended Citation**

This Other is brought to you for free and open access by the Academic Department Resources at UNM Digital Repository. It has been accepted for inclusion in University Libraries & Learning Sciences Faculty and Staff Publications by an authorized administrator of UNM Digital Repository. For more information, please contact amywinter@unm.edu, lsloane@salud.unm.edu, sarahrk@unm.edu.
Please cite as:


ISBN: 978-1-911669-10-4

https://wcol2019.ie

@WCOL2019

Acknowledgements

The Editors would like to acknowledge the contributions of both Denise Brown and Sandra Forster to the 2019 ICDE World Conference Proceedings. We would also like to acknowledge the invaluable contribution members of our own team in the National Institute for Digital Learning (NIDL) made in helping to stage such a major international event. The success of the event would not have been possible without the efforts of Happening Conferences and Events and we are grateful to Anne Doherty and her amazing team for all of their work. Lastly, we would like to thank the ICDE team for their support in helping Dublin City University (DCU) to host the World Conference.

This work is licensed under a Creative Commons Attribution 4.0 International License: [https://creativecommons.org/licenses/by/4.0/](https://creativecommons.org/licenses/by/4.0/)
# TABLE OF CONTENTS

Conference Poem ........................................................................................................................................... 12

The Dublin Declaration .................................................................................................................................... 14

Conference Committees ................................................................................................................................. 18

Full Papers

*If We Knew Then What We Know Now: 15 Years of Data on Improving Online Learning Design* ................................................. 19

**DEB ADAIR**, **KAY SHATTUCK**, **BARBRA BURCH**, **WHITNEY ZIMMERMAN** ................................................................................................................. 19

*Online Student Workload: Perceptions of Workload and Actual Self-Log of Study Time at the Open University of Japan* ................................................................................................................................. 30

**KUMIKO AOKI** ........................................................................................................................................... 30

*The Production of Open Educational Resources as an Alternative for Training Volunteer Health Workers in Rural Communities in Tanzania* ........................................................................................................ 39

**KALINE ARAÚJO**1, 2, **RICARDO VALENTIM**1, 2, **THAISA LIMA**2, **DEYSE MOURA**2, **MAURICIO OLIVEIRA JR**1, 2, **ANDERSON ALMEIDA**1, **ARTHUR BRAZ**2 ........................................................................................................... 39

*Intelligent Tutors for Personalized Learning in Online Environment: Challenges and Opportunities* ................................. 51

**VASUDEVA ARAVIND**2, **JASMA BALASANGAMESHWARA**2, **CRAIG REFUGIO**3, **DEBRA FERDINAND-JAMES**4, **KRISHNAN UMACHANDRAN**5, **VALENTINA DELLA CORTE**5, **GIOVANNA DEL GAUDIO**5, **IGOR JURCIC**5, **ANAND KHANDARE**6 ................................................................................................................ 51

*Mix and Match: University-Corporate Cross-Fertilisation in Active Learning Approaches for Soft Skills Development* .. 58

**DEBORAH ARNOLD**1, **MARIA CINQUE**2, **MATTEO UGGERI**3, **MIRELA MAZALU**4 ................................................................................................................................. 58

*Developing Global Understandings of Online Teaching Practices: Transforming Practices through Collaborative Self-Study* ................................................................................................................ 69

**BETHNEY BERGH**, **CHRISTI EDGE**1, **ABBY CAMERON-STANDERFORD**1, **KATHERINE MENARD**1, **LAURA VANDENAVOND**1, **KATHRYN JOHNSON**1 ........................................................................................................ 69

*Moving Beyond to Capture or Not to Capture: Lecture Capture Integration in Learning and Teaching* ............................... 78

**DHIRAJ BHARTU**1, **EVAN NAQIOLEVU**1, **VARUNESH RAO**1, **SOM NAIDU** ............................................................................................................................. 78

*Online Tests and Feedback Practices: Reality Check* ............................................................................................. 89

**BOPELO BOITSHWARELO**1 ........................................................................................................................ 89

*Every Contact Counts - Prison Officer Education in Ireland* ......................................................................................... 98

**FIONNUALA BRENNAN**1, **RAPHAE O'KEEFFE**2 ............................................................................................ 98

*Designing Transformative Online Learning Environments: A Case Study* ................................................................. 108

**LENI CASIMIRO**1 ........................................................................................................................................... 108
INTERACTIVE E-LEARNING TOOLS AND PEDAGOGY FOR ENGAGING STEM EDUCATION AND SKILLS DEVELOPMENT IN THE DIGITAL ERA: CHALLENGES AND OPPORTUNITIES ................................................................................................................................. 118

YAKOV E. CHERNER1, JAMES UHOMOBHI2, MAIJA M. KUKLA2 .................................................................................................................................................................................. 118

HARNESSING THE POTENTIAL OF ONLINE LEARNING TO BUILD EFFECTIVE & SUSTAINABLE LIFELONG LEARNING FRAMEWORKS: CASE STUDIES FROM IRELAND AND SINGAPORE .................................................................................................................. 128

GERARD CREANER1 ................................................................................................................................................................................................. 128

A DIGITAL FOOTPRINT FROM EIRE TO OZ: ADVANCING INTERNATIONALISATION THROUGH A COLLABORATIVE ONLINE INTERNATIONAL LEARNING PROJECT .................................................................................................................. 146

RITA DAY1, ALAIN GROSSBARD1 .................................................................................................................................................................................. 146

WORK MATTERS: DISTANCE GRADATES AND THE EMPLOYABILITY DISCOURSE .................................................................................................................. 155

LORRAINE DELANEY1 ................................................................................................................................................................................................. 155

CONCEPTS AND TECHNIQUES OF THE CINEMA IN THE HUMAN TRAINING IN HEALTH TO FACE SYPHILIS .................................................................................................................. 166

ALINE DIAS1, RICARDO VALENTIM1, JANE DANTAS2, SARA TRINDADE3, ANTÓNIO MOREIRA4, ROSANGELA MORAES1 .................................................................................................................................................. 166

IDENTIFICATION OF KEY ENABLERS FOR E-LEARNING DELIVERY MODES IN UNDERGRADUATE PROGRAMMES, USING A LITERATURE ANALYSIS METHODOLOGY .................................................................................................................. 174

KATE DUNNE1 ................................................................................................................................................................................................. 174

TE WHAKAPAIPAI, DILÁRUCHÁN: TOWARDS DECOLONISATION VIA THE DIGITAL SELF-DIRECTED STUDY OF INDIGENOUS LANGUAGES .................................................................................................................. 186

JOHN EGAN1 ................................................................................................................................................................................................. 186

FUTURE SKILLS AND THE FUTURE OF HIGHER EDUCATION .................................................................................................................. 193

ULF-DANIEL EHLERS1 ................................................................................................................................................................................................. 193

UTILISING A META-DATA STANDARD FOR DIGITAL CREDENTIALS AND RECOGNITION OF OPEN LEARNING .................................................................................................................. 208

JOCHEN EHRENREICH1, ELENA TREPULÈ2 .................................................................................................................................................................................. 208

A JUGGLING ACT: EXPLORING STUDENT NARRATIVES OF LEARNING ONLINE .................................................................................................................. 223

ORNAR Farrell1 ................................................................................................................................................................................................. 223

PAVING THE WAY TO ONLINE TEACHING: INTRODUCTION TO AN eTUTORING COURSE .................................................................................................................. 233

MARGARET FARREN2, YVONNE CROTTY1, MADELEINE MURRAY1, ANNE PHELAN3 .................................................................................................................................................. 233

ONLINE LEARNING: FROM BLENDED LEARNING TO CONNECTED LEARNING WITH CONTENT CURATION .................................................................................................................. 243

GILBERT FAURE1, FRANÇOIS ARNAL2 .................................................................................................................................................................................. 243

GROUP FLOW STATES OF INTERGENERATIONAL NETWORKS WITHIN AGE FRIENDLY ACADEMIC SETTINGS .................................................................................................................. 252

ALEXANDER G. FLOR1 ................................................................................................................................................................................................. 252

TALK TO THEM NOT AT THEM: A TEACHER-INITIATED MODEL OF ENGAGEMENT (TIME) IN ONLINE LEARNING .................................................................................................................. 257

BENJAMINA PAULA FLOR1,2 ................................................................................................................................................................................................. 257

FROM THEORY TO PLATFORM: DESIGNING SOFTWARE TO SUPPORT ONLINE WISDOM COMMUNITIES .................................................................................................................. 272

CASEY FRECHETTE3, CHARLOTTE NIRMALANI GUNAWARDENA2, LUDMILA LAYNE3 .................................................................................................................................................. 272
Harnessing Massive Online Open Courses for Innovations in Museum Education and Beyond ........................................ 282

Silvia Gallagher1, Rachel Moss1 ........................................................................................................................................ 282

Online Education and Public Servants: Towards a Capacity Development Results Framework ........................................ 292

Juvi Lizette Gervacio1 ....................................................................................................................................................... 292

Empowering Learners in India Through Open Schooling: A Status Paper ....................................................................... 303

Tharkeshwar Nath Giri1 ....................................................................................................................................................... 303

Bridging the Skills Gap in the Data Science and Internet of Things Domains: A Vocational Education and Training Curriculum ........................................................................................................................................ 312

Gkamas V.1, Rigou M.1, Paraskevas M.2, Zarouchas T.1, Perikos I.1, Vassiliou V.3, Gueorgiev I.4, Varbanov P.4, Sharkov G.4, Todorova C.4, Sotiropoulou A.5 .......................................................................................... 312

Extension Activities in Higher Education: A Process that Promotes the Social Inclusion ............................................... 321

CRISTINE MARTINS GOMES DE GUSMÃO1 .................................................................................................................................. 321

Pedagogical Innovation in Lifelong Learning: The Use of Technological Mediation in the Formation of Preceptors in Health in Brazil ........................................................................................................ 331

Eloiza da Silva Gomes de Oliveira2, Carlos Alberto Pereira de Oliveira2, Ronaldo Silva Melo2, Rodrigo Borges Carvalho Perez2, Caio Abibol Carvalho1 ....................................................................................... 331

Reimagining Future-Ready Curricula, Teaching and Learning in Online Education ............................................................... 340

Ignatius G. P. Gous1 ............................................................................................................................................................... 340

Measuring — and Engendering — Lifelong Learning Readiness .......................................................................................... 350

Ignatius G. P. Gous1, Jennifer Roberts1 .................................................................................................................................. 350

The Effects and Benefits of Asynchronous Fora: A Student Perspective .................................................................................. 370

Selina Griffin1 ............................................................................................................................................................................ 370

Do Learners Now Have Ownership of Technology-Enhanced Learning? ............................................................................ 379

Selina Griffin1 ............................................................................................................................................................................ 379

Distributed Co-Mentoring as a Means to Develop Culturally Inclusive Online Learning Communities ................................ 389

Charlotte Gunawardena1, Gayathri Jayatilleke2, Geetha Kulasekara2, Malinda Kumarasinha2 ................................................ 389

Incubators of Innovation: Building Creativity, Diversity and Engagement into the Online Learning Environment .......... 401

Angela Gunder2, Melody Buckner1, Matthew Romanoski1, Luis Carrion1 .................................................................................. 401

Model for Content Recommendation in Massive Open Online Courses: Motivational Actions in a Forum ...................... 408

CRISTINE GUSMÃO1, Josiane Machiavel1, Priscilla Mendes1 ........................................................................................................... 408

Facilitating Your Online Course: Where to Focus Your Efforts When a Course is in Progress ........................................... 420

Charles Hodges1, Patrick Lowenthal2 ........................................................................................................................................ 420

EPortfolio: The Role of Reflection in Graduate Online Learning and Pedagogy ................................................................. 431

Dr Debra Hoven1 ....................................................................................................................................................................... 431
SYSTEMATIC PEER REVIEWING VERSUS A DISCUSSION FORUM FOR PROMOTING ONLINE LEARNER SUCCESS: AN EVALUATION OF INNOVATIVE LEARNING DESIGN FOR POSTGRADUATE STUDENTS ............................................................... 443

GWYNE TH HUGHES 1, LESLEY PRICE 1 ........................................................................................................... 443

OPENNESS IN ASSESSMENT PRACTICES: REVIEWING ASSESSMENT IN AN OPEN DISTANCE E-LEARNING (ODeL) ENVIRONMENT ................................................................. 453

LORETTE JACOBS 3 ............................................................................................................................................ 453

STUDENTS’ ENGAGEMENT IN THEIR OWN AND OTHER STUDENTS’ PROCESS OF INQUIRY ......................................................................................................................... 464

MALIN JANSSON 3, STEFAN STENBOM 1, FREDRIK ENOKSSON 1, STEFAN HRASINSKI 3 ........................................................................................................................................ 464

ONLINE TEACHER EDUCATION: A WAY TO CREATE A MORE DIVERSE TEACHER WORKFORCE ........................................................................................................ 476

THURIDUR JÓHANNSDÓTTIR 1, AMALÍA BJÖRNSDÓTTIR 3 ....................................................................................... 476

VIRTUAL WRITING GROUPS: COLLEGIAL SUPPORT IN DEVELOPING ACADEMIC WRITING CAPACITY ........................................................................................................ 485

CAROL JOHNSON 1, JENNIFER LOCK 2 ........................................................................................................ 485

VIRTUAL REALITY’S PROMISES AND PITFALLS FOR DISTANCE EDUCATION: A LITERATURE REVIEW .................................................................................................................... 493

KATHRYN JOHNSON 1, 2 ........................................................................................................................................ 493

ROLE OF INFORMAL EDUCATION SUPPORTED BY SOCIAL NETWORKS AND INTERNET PLATFORMS IN THE DEVELOPMENT OF THE ANTI-CORRUPTION MOVEMENT IN RUSSIA ........................................................................................................ 501

ALINA KISLOVA 1 ................................................................................................................................................ 501

HYBRID HOMEWORK – BLENDING BLENDED LEARNING AND FACE TO FACE IN FOUR UNDERGRADUATE EDUCATION PROGRAMMES .................. 511

THOMAS KJÆRGAARD 1 .................................................................................................................................... 511

THE IMPACT OF ONLINE PROGRAM MANAGEMENT (OPM) ON THE GROWTH OF ONLINE LEARNING: A CASE STUDY ....................................................................................... 521

SUSAN KOWALEWSKI 1, KRISTEN HORTMAN 2 .............................................................................................. 521

EFFECT OF CUSTOMER BASED BRAND EQUITY ON M-SERVICE ADOPTION: A CASE OF UNDERGRADUATES OF THE OPEN UNIVERSITY OF SRI LANKA .................................................................................................................. 530

ISHARA LAKMALI 2, NALIN ABYESEKERA 1 .................................................................................................... 530

RESEARCH ON MOBILE LEARNING IN OPEN AND DISTANCE EDUCATION-BASED ON ELECTRICAL AND ELECTRONIC TECHNOLOGY COURSE OF JIANGSU OPEN UNIVERSITY ....................................................................................... 546

WEIYAN LIU 1, FENG LU 2 ................................................................................................................................... 546

NEW APPROACH TO FARMERS’ LEARNING IN AN EVOLVING CONTEXT .......................................................... 555

XIAOZHOU LIU 1, DAPENG HANG 1 .................................................................................................................. 555

ACHIEVING KNOWLEDGE IN ACTION THROUGH ONLINE COLLABORATIVE LEARNING: WHAT WE HAVE LEARNED? .............................................................. 560

JENNIFER LOCK 1, PETREA REDMOND 2 ...................................................................................................... 560

THE OERU RUBIK’S CUBE: FITTING THE PIECES TOGETHER FOR TRANSTATIONAL MICRO-CREDENTIALING .......................................................................................... 569

WAYNE MACINTOSH 1, VALERIE PACEHEY 2, MATT DYCK 3, MICHAEL LOONEY 3, CLAIRE GOODE 4 .......................................................................................................................... 569

GLOBAL BEST PRACTICES IN ONLINE LEARNING TO SUPPORT A QUALITY STUDENT EXPERIENCE ........................................................................................................ 580

JENNIFER MATHES 1 .......................................................................................................................................... 580

CULTURE VULTURES: HOW OPEN IS OPEN? ................................................................................................... 587
CONCHÚR MAC LOCHLAINN1, MAIRÉAD NIC GIOLLA MHICHÍL1, ELAINE BEIRNE1, MARK BROWN1 .................................. 587

Design and Development of Online Learning Resources to Foster Academic Writing Skills in an ESP Flipped Classroom Context ........................................................................................................ 595

ANTONIO MARTÍNEZ-SÁEZ2 .......................................................................................................................... 595

Distance Learning in Higher Education in Brazil .......................................................................................... 605

JOÃO MATTAR3, DANIELA RAMOS2 ........................................................................................................... 605

Mixed Media: Dual Online Methodologies for a Complex Audience ............................................................. 612

ANNE-MARIE MILLER1, IAIN MACLAREN2, MATTHEW D GRIFFIN2, MARTIN O’DONNELL2, MARK WATSON1 .................................................................................................................. 612

Good Practices in Online and Distance Education Higher Education in Latin America and the Caribbean ............. 624

MARY MOROCHO-QUEZADA1, ALBANIA CAMACHO-CONDO1 ..................................................................... 624

Microlearning in Health Area: Successes and Limits in the Yellow Fever Vaccination Course ..................... 631

LAURA MOTA1, THOMAS PETIT2, DANIELA FONTINELE3, VINICIUS OLIVEIRA3, LUCIANA DANTAS2, ANA CRISTINA FURNIEL3, ADRIANA COSER GUTIERREZ3, ANA PAULA MENDONÇA2 ........................................................................... 631

Creative Approaches to Curriculum Design: Overcoming Barriers to Translation of Health Subjects into Fully Online Formats ........................................................................................................ 640

ASHLEY NG1, JESSICA BIESIEKIER1, EMMA STIRLING1, TAM NGUYEN2 .................................................................. 640

Generating Immersion Teacher Language Awareness Through Online Learning ........................................... 650

TJ Ó CEALLAIGH1, KAREN NÍ CHLOCHASAIGH1 .......................................................................................... 650

A Model of Engagement for the Online Learner in the Liminal Space of Dissertation Research .................. 660

MAJELLA O’DEA1, ATRACHTA BRENNAN1 .................................................................................................. 660

The Process of Transforming Advertising Videos into Open Educational Resources: The Case of the ‘Sífilis Não’ Project ........................................................................................................................................ 673

MAURICIO OLIVEIRA JUNIOR1, KALINE ARAÚJO1, JUCIANO LACERDA1, MARIA ALVES2, CARLA OLIVEIRA3, CARMEN RÊGO2, LILIAN MUNEO1 ............................................................................. 673

Implementing Gamification to Enhance Digital Competency .............................................................................. 681

ERNA OLIVER1 .............................................................................................................................................. 681

Let’s Play Serious Games ................................................................................................................................ 688

WILLEM H. OLIVER2 ...................................................................................................................................... 688

Chaotic by Design: Student Reactions to a Graduate-Level Leadership Course Designed with Self-Directed Learning Principles ........................................................................................................ 699

JASON OPENO1 .............................................................................................................................................. 699

Opening Pathways for Access, Inclusion, Flexibility, and Quality ........................................................................ 714

EBBA OSSIANNILSSON1, JAMES GLAPA-GROSSKLAG1, XIANGYANG ZHANG1 ................................................................ 714

Towards Operational Excellence in Aviation Training: OEF Framework for Developing Integrated Systems for Online Learning & Development .................................................................................. 726

TEEMU PATALA1, ALAN BRUCE2, OLLI LAINTILA2 .......................................................................................... 726
ENGAGEMENT PATTERNS AND LEARNER STRATEGY PROFILES IN ONLINE HIGHER EDUCATION: A LEARNING ECLOGIES PERSPECTIVE... 737

MITCHELL PETERS1, MONTSE GUITERT CATASÚS1, MARC ROMERO CARBONELL1 .......................................................... 737

DEAO: AN INNOVATIVE FRAMEWORK TO IMPROVE ONLINE LEARNING EXPERIENCES USING UX DESIGN APPLIED IN THE EDUCATION DOMAIN .......................................................................................... 749

THOMAS PETIT1, LAURA MOTA1, DANIELA FONTINELE2, LUCIANA DANTAS2 ................................................................. 749

A MOOC QUALITY SCALE: VALIDATION AND EXPERIMENTATION IN A PRE-EXPERIMENTAL DESIGN .......................................................... 760

BRUNO POELLHUBER1, NORMAND ROY1, NATHALIE CAIRE FON1 .................................................................................... 760

HOLISTIC MODEL TO PREVENTING CHEATING IN ONLINE LEARNING ........................................................................... 773

JIHAN RABAH1, WYNNPUAL VARELA1, MANASVINI NARAYANA1, ANIK DE ST HILAIRE1 ........................................... 773

FUTURE READY DISTANCE EDUCATORS: A METACOGNITIVE STUDY ........................................................................... 783

JENNIFER ROBERTS1, HUGO VAN DER WALT1 ................................................................................................................... 783

THE IMPACT OF THE SOCIO-AFFECTIVE VARIABLES IN THE ONLINE STUDENT TRAJECTORY OF THE INSTITUTO PROFESSIONAL IACC ....... 800

RAYMOND ROSAL1, JORGE VALENZUELA2 ......................................................................................................................... 800

EMPLOYING SOCIAL LEARNING ANALYTIC METHODS (SLAMs) TO REIMAGINE THE SOCIAL DYNAMIC OF ONLINE LEARNING COLLABORATIONS .................................................................................... 817

DAMIEN SANCHEZ1, NICK FLOR1, CHARLOTTE "LANI" GUNAWARDENA1, ........................................................................... 817

KEY ROLE OF MODULARIZATION FOR NEW GLOBAL PATHWAYS EXPANDING ACCESS TO MULTIPLE STUDY PROGRAMS ........... 833

CHRISTIAN-ANDREAS SCHUMANN1, KEVIN ROTHER2, CLAUDIA TITTMANN1, HELGE GERISCHER3, OLIVER SCHIRMER4, XIAO FENG4, ANNA-MARIA CLAU8 ................................................................. 833

PREREQUISITES OF DEVELOPING MOOCs IN ADVANCING INNOVATION COMPETENCIES DESIGNED FOR INDONESIA 4.0 ............. 846

MAXIMUS GORKY SEMBRING1, GAYUH RAHYU2 ................................................................................................................ 846

EDUCATIONAL DATA MINING TO PROMOTE ACTVE METHODOLOGIES: ANALYSIS OF LEARNING PATTERNS IN SYPHILIS COURSES AT AVASUS ................................................................. 860

ARTHUR HENRIQUE GARCIA RÊGO1,2,3, JÂNIO GUSTAVO BARBOSA1,2,4, RICARDO ALEXANDRO DE MEDEIROS VALENTIM1,2, CARLOS OLIVEIRA2,5, KARILANY COUTINHO2, MARIA CRISTINA GUIMARÃES3, MARILYN BONFIM4 .... 860

CARPE DIEM FOR TRANSFORMATION ......................................................................................................................... 876

GILLY SALMON1, ANTOINETTE VAN DE MERWE2, ARNOLD SCHOONWINKEL2 ............................................................... 876

DESIGNING OF OER BASED ON PBL: A HUMANITARIAN APPROACH FOR THE LEARNING OF PROGRAMMING AT THE BRAZILIAN LAIS .... 888

DANIELI SILVA DE SOUZA RABELO1, CARLOS ALBERTO PEREIRA DE OLIVEIRA2, RICARDO ALEXANDRO DE MEDEIROS VALENTIM1,2 ........................................................................................................... 888

A COMMAND-LINE BASED EXAM GENERATION SYSTEM FOR COMPUTER SCIENCE EDUCATION .............................................................. 905

MOTOFUMI T. SUZUKI1, YOSHITOMO YAGINUMA1, HARUO KODAMA1 ................................................................................... 905

WEB TOOLS AND STUDENT GENERATED CONTENT: AN INDICATOR OF ENGINEERING STUDENT GRADUATE ATTRIBUTES ........ 915

BRONWYN SWARTZ1, CHERYL BELFORD1 ......................................................................................................................... 915

EXPLORING THE FACTORS AFFECTING THE EFFECTIVENESS OF ONLINE LEARNING: TAKING ART COURSES AS AN EXAMPLE ......... 927
YINGSHAN TANG\textsuperscript{1}, HANG XU\textsuperscript{1}, YING WANG\textsuperscript{1} .......................................................................................................................... 927

THE CHALLENGES FACING DISTANCE VOCATIONAL LEARNING ARISING FROM MIGRATIONS FROM THE RURAL DISTRICTS TO URBAN CENTRES: A VIEW FROM WITHIN THE OPEN UNIVERSITY OF CHINA .......................................................... 941

ZHAO TINGTING\textsuperscript{2}, STEVE COWAN\textsuperscript{2}, YUE PENG\textsuperscript{3} .......................................................................................................................... 941

EVALUATING THE IMPACT OF AUGMENTING THE MATERIAL OF THE “GUIDE TO BLENDED LEARNING”, COMMONWEALTH OF LEARNING VIA THE ARTutor PLATFORM.................................................................................................................. 955

AVGOUSTOS TSIONAKOS\textsuperscript{1}, MARTI CLEVELAND INNES\textsuperscript{2} .......................................................................................................................... 955

CARE AND RIGOR IN ONLINE COURSES: AN ANALYSIS OF FACULTY & STUDENT PERSPECTIVES .................................................................................. 968

LAURA VANDENAVOND\textsuperscript{1}, KATHERINE MENAR\textsuperscript{1}, KATHRYN JOHNSON\textsuperscript{1}, ABBY CAMERON-STANDERFORD\textsuperscript{2}, BETHNEY BERGH, CHRISTI EDGE\textsuperscript{1} .................................................................................................................. 968

STUDENT ACCESS AND SUCCESS THROUGH HYBRID LEARNING: A SOUTH AFRICAN UNIVERSITY’S BUSINESS AND DELIVERY MODEL ...... 981

ANTOINETTE VAN DER MERWE\textsuperscript{3}, ARNOLD SCHOONWINKEL\textsuperscript{1} .......................................................................................................................... 981

THE COMMUNITY OF INQUIRY FRAMEWORK: FUTURE DIRECTIONS - SHARED METACOGNITION .......................................................... 991

NORMAN VAUGHAN\textsuperscript{1}, MARTHA CLEVELAND-INNES\textsuperscript{2} .......................................................................................................................... 991

DEGREES OF (UN)EASE: EMERGING RELATIONSHIPS BETWEEN ONLINE PROGRAMME MANAGEMENT COMPANIES AND UNIVERSITY STAKEHOLDERS IN AN UNBUNDLING LANDSCAPE .................................................. 1001

SUKAINA WALJI\textsuperscript{1}, LAURA CZERNIEWICZ\textsuperscript{1} .......................................................................................................................... 1001

SHIFTING PARADIGMS: INNOVATING LEARNER-EMPOWERED EMERGENT TECHNOLOGY INTEGRATION FOR LEARNING ON DEMAND ...... 1012

NORINE WARK\textsuperscript{1}, MOHAMED ALLY\textsuperscript{1} .......................................................................................................................... 1012

A PARADIGM SHIFT IN ODL: FROM DISENGAGED STUDENTS TO TRANSFORMATIVE LEARNERS AND LEADERS .......................................................... 1026

NORINE WARK\textsuperscript{1}, MOHAMED ALLY\textsuperscript{1} .......................................................................................................................... 1026

ALIGNING PROFESSIONAL IDENTITY WITH INSTITUTIONAL CULTURE: THE ROLE OF EDUCATORS’ DIGITAL FLUENCY IN HARNESSING THE POTENTIAL OF ONLINE AND TECHNOLOGY ENHANCED LEARNING.......................................................................................... 1041

NIALL WATTS\textsuperscript{1}, CONOR GALVIN\textsuperscript{1} .......................................................................................................................... 1041

HISTORICAL ISSUES, ADVANCEMENT AND EMPOWERMENT OF WOMEN THROUGH OPEN DISTANCE LEARNING (ODL) .................................................. 1053

HANNELIE WOOD\textsuperscript{1} .......................................................................................................................... 1053

THE EVOLUTION AND EXPLORATION OF DISTANCE EDUCATION MEANS IN RURAL CHINA .......................................................................................................................... 1064

HUI YANG\textsuperscript{3}, GU YUAN\textsuperscript{3} .......................................................................................................................... 1064

TEACHING THE ART OF COMPUTER PROGRAMMING AT A DISTANCE BY GENERATING DIALOGUES USING DEEP NEURAL NETWORKS..... 1071

YIJUN YU\textsuperscript{3}, XIAOZHU WANG\textsuperscript{3}, ANTON DIL\textsuperscript{1}, IRUM RAUF\textsuperscript{1} .......................................................................................................................... 1071

MOOCs FORMAT OF OPEN EDUCATIONAL RESOURCES (OER) REPOSITORIES: AN ALTERNATIVE ROUTE IN CHINA .................................................. 1082

XIANGYANG ZHANG\textsuperscript{3}, SHUCHIU HUNG\textsuperscript{2} .......................................................................................................................... 1082

FORESTRY EDUCATION IN ACTION: TEAM-BASED APPROACH DELIVERING COLLABORATIVE LEARNING FOR LARGE ONLINE REPURPOSED OER COURSES .......................................................................................................................... 1092

MIN QIAN (MICHELLE) ZENG\textsuperscript{3}, ANIL SHRESTHA\textsuperscript{1}, HAILAN CHEN\textsuperscript{3}, CHRIS CROWLEY\textsuperscript{3}, GUANGYU WANG\textsuperscript{1} .......................................................................................................................... 1092
HOW AGRICULTURAL TELEVISION PROGRAMMES AID THE TRAINING OF HIGH QUALITY FARMERS: WITH THE FORMER “LAND OF CABTS” OF THE CHINA CENTRAL TELEVISION 7 AS AN EXAMPLE

XIAO ZHOU

1102
Employing Social Learning Analytic Methods (SLAMs) to Reimagine the Social Dynamic of Online Learning Collaborations

Damien Sanchez¹, Nick Flor¹, Charlotte "Lani" Gunawardena¹,

¹University of New Mexico, USA

Abstract

As online networks expand, learning collaborations will occur across disciplines, countries, and people. A particular challenge is determining the process and progress of these collaborations, and how the social dynamics of interacting groups support knowledge construction. Traditional methods that rely predominantly on content analysis of transcripts to determine social construction of knowledge are time consuming to conduct and often do not provide actionable data to improve the process before it is completed. One answer to this challenge is emerging Social Learning Analytic Methods (SLAMs) that offer robust and expedient means to analyze the performance of interacting groups online. The purpose of this study is to explore the social dynamic that supports knowledge construction in interacting groups by employing SLAMs. We will use a twofold approach. First, we will demonstrate how SLAMs can be utilized in a formal learning environment during the rollout of an online university course so that findings can be used to improve the course as it is being offered. Second, SLAMs will be applied to Twitter which supports informal online learning to determine social construction of knowledge with a limited character set. SLAMs examined include, but are not limited to, sentiment analysis and social network analysis. These analyses can provide a valuable snapshot during roll out of collaborations whether in online courses or on social media so that they can be improved before they are concluded. By integrating SLAMs into online learning experiences, digital scholarship can reimagine online design, teaching, and evaluation to help meet the future needs of online collaborations in a variety of contexts. Using SLAMs, this study found that in a formal learning environment, higher phases of knowledge construction may be associated with postings containing high levels of positive sentiment and social presence. Finally, this study found that in social media informal learning environments, the social construction of knowledge occurred primarily within various stages of PI of the Interaction Analysis Model.

Keywords: Social Network Analysis, Social Learning Analytics Methods, Sentiment Analysis, Clustering Analysis, OILS Twitter Scraper
Introduction

This study uses data from both a formal and informal learning environment in order to illustrate the fidelity of Social Learning Analytics Methods (SLAMs) in both domains. Formal learning environments encompass a broad range of contexts including face-to-face classroom instruction and online learning. The common chord being an association with a traditional learning experience. This study uses a discussion board from an online course as its formal learning environment of interest. On the other hand, informal learning environments include just about everything outside of the traditional classroom as well as learning that comes from everyday experiences (Merriam & Caffarella, 1999). One of the most promising frontiers of informal learning is social media because it “is clearly the largest, richest and most dynamic evidence base of human behavior, bringing new opportunities to understand individuals, groups and society” (Batrinca & Treleaven, 2015, p. 90). This study uses Twitter as its informal learning environment of interest.

Twitter is a social media tool that allows users to compose single messages, called Tweets, to discussions organized according to thematic hashtags. Once a user has created a Tweet, users can take a variety of actions to share the information including creating a reply by writing someone’s username at the beginning of the Tweet or retweeting content by forwarding it to people within their networks (Twitter, 2016). Part of what makes Twitter a strong informal learning resource is its ability to help users organize knowledge. “Twitter hashtags help us to find discussions, snippets of knowledge, and hyperlinks to further resources from which we may learn” (Dron & Anderson, 2014, p. 181).

This study uses Social Construction of Knowledge (SCK) as its framework to identify learning because both formal discussion forums and informal Twitter dialogue share a need for strong social interaction. SCK is a subset of social constructivist theory, along with the zone of proximal development, which establishes the vital role socialization plays in the learning process (Vygotsky, 1978). Pea (1993) observes that "Knowledge is commonly socially constructed, through collaborative efforts toward shared objectives or by dialogues and challenges brought about by differences in persons' perspectives" (p. 48). The shared objectives aspect is especially pertinent to the formal learning environment as all students seek to participate in the activity. The dialogues based on various perspectives is central to the innumerable voices that contribute to Twitter hashtags.

A variety of different methods have been used to measure SCK. Notable among these are the approaches proposed by Henri (1992) and Gunawardena, Lowe, and Anderson (1997). Both of these works focus on types
of Computer Mediated Communication (CMC), specifically online discussion forums. Henri (1992) recommends content analysis as one of the most important methods that should be used to understand SCK because of the complexities in assessing social and cognitive processes that underlie online discussions. Content analysis should be conducted according to 1) social dimension, 2) interactive dimension, 3) cognitive skills, and 4) metacognitive skills. One drawback to this approach is that it is difficult to distinguish between cognitive and metacognitive application of skills. In addition, interaction is descriptive and only one category is provided to assess this critical aspect of online learning.

Gunawardena et al. (1997) developed the Interaction Analysis Model (IAM) to qualitatively examine interactions among a collaborative group during the process of knowledge construction. The IAM was employed to examine the interaction that occurred in an online global debate to determine whether knowledge was constructed within the group through dialogue and discourse, and whether participants changed their understanding or developed new knowledge as a result of group interaction. Based on social constructivist and sociocultural views of learning, the model describes five phases of knowledge co-construction that are identified via content analysis: sharing and comparing constitute Phase I; dissonance is the focus of Phase II; negotiation and co-construction comprise Phase III, testing tentative constructions is incorporated in Phase IV, and statements and application of newly co-constructed knowledge are at the heart of Phase V.

Regardless of the method used to analyze SCK, both of these approaches agree that some content analysis is required to determine the context and meaning of the messages composed in online spaces. Unfortunately, reading through mountains of messages is painstaking and time-consuming work. Therefore, there is a need for additional tools that can facilitate the work of analysts who seek to understand SCK.

The Utility of SLAMs to SCK Research

Incorporating SLAMs into studies focused on identifying SCK can address the shortcomings identified by researchers using existing methods such as Lucas and Moreira (2015) who recognize “content analysis per se disregards the temporal dimension of interactions and should, therefore be complemented by other methods that can help researchers better understand such processes and facilitate additional in-depth analysis” (p. 1505). For example, time is a primary focus of the analysis conducted when using sentiment analysis and social network analysis (SNA). Datapoints are collected over time in both methods to clearly illustrate the growth of knowledge (sentiment analysis) and how frequent interactions between people gradually develop (SNA). In Gunawardena, Flor, Gómez, and Sánchez (2016) we argue that SLAMs should be used to assist
researchers who are working with large volumes of qualitative data. SLAMs are powerful methods that can help researchers quickly understand trends in large and unstructured datasets, but they are no replacement for the rigor afforded by content analysis. This study builds on this assertion by providing further details regarding how SLAMs and IAM-oriented content analysis complement one another.

By reimagining how mixed method research can be conducted using SLAMs along with traditional content analysis we suggest a way to transform the current practice of teaching online. For example, it is very challenging for online instructors to determine the quality of the interactions that take place within course discussion boards formatively because of the time and effort it takes to assess them. In many cases such assessments are often never completed even after courses have concluded. SNA offers a solution to this common challenge as the diagrams produced by this method can be used to incrementally ascertain the frequency and quality of interactions. Even more importantly, SNA can be conducted using existing data from discussion boards and there are a host of free tools like R, NodeXL, and Gephi to support the implementation of this method. Instructors who make SNA a part of their courses can display graphs that show which student(s) are most important to the discussion and which student(s) are lurking on the periphery. This can then serve as a motivating factor for students to focus on their online interactions and make sure they are more engaged in course activities. Using SNA to track student interactions has the potential to result in increased student engagement that will ultimately lead students to better futures and instructors to more robust teaching practices.

**Purpose**

The purpose of this study is to explore how SLAMs can serve as a means to analyze the social dynamic that supports knowledge construction in both formal and informal online discussions between collaborative groups.

**Research questions**

The research questions posed in this study are as follows:

1. How can SLAMs be used to assess the social dynamic that supports knowledge construction in formal online discussions?
2. How can SLAMs be used to assess the social dynamic that supports knowledge construction in an informal learning environment to determine how voluntary participation can lead to learning?
Social Learning Analytic Methods (SLAMs)

SLAMs refer to a host of analytics methods including but not limited to cluster analysis, sentiment analysis, and social network analysis.

Cluster Analysis
Cluster analysis is a method for determining the similarity between a collection of individuals based on a set of features (Romesburg, 2004). In the context of a discussion thread, cluster analysis groups postings in terms of similar word usage. It is useful for determining similarities between postings between different users.

Sentiment Analysis
Sentiment analysis is defined by Batrinca and Treleaven (2015) as “the application of natural language processing, computational linguistics and text analytics to identify and extract subjective information in source materials” (p. 90). Sentiment analysis is performed by creating a list of positive (good, wonderful, fantastic, etc.) and negative words (bad, awful, terrible, etc.), known as a lexicon, and using automated approaches to calculate sentiment orientation as either positive, negative, or neutral (Liu, 2012). Note that a lexicon is the most crucial resource for sentiment analysis because it establishes the words and statements that are used to determine sentiment orientation (Feldman, 2013).

Lexica Development
To conduct a sentiment analysis, data needs to be coded for positive and negative words. Coding is done automatically according to lists, called lexica, of positive and negative words. These words are then included in an automatic parser which produces scores for a given transcript that indicate whether the overall sentiment was positive or negative. The words included in lexica can expand this technique beyond positive and negative sentiment. For example, the lexicon used in Gunawardena et al. (2016) was created to assess social presence in an online course.

To assess social presence, instead of positive and negative words, words that contributed to or detracted from the creation of social presence were used. Words appropriate for each of these categories were identified by conducting a content analysis of the transcript. The resulting scores indicated how much social presence was being created in the course.
Social Network Analysis (SNA)

SNA can be defined as a method of identifying the relationships among social entities (e.g., dyads, triads, and larger groups) and analyzing the implications of interaction patterns (Wasserman & Faust, 1994). The key output of SNA is the sociogram which was first introduced in the early 1930s by Moreno (1953). The intent behind the sociogram is to visually illustrate the relationships between people mapping out the interactions between people or groups in a network.

In this study SNA will only be used to answer the first research question because the dataset provides the clearest example of how SNA can be used to track and enhance online interactions.

Method of analysis

SLAMs in a Formal Online Environment

In a formal online learning environment, the input for SLAMs is a table (see Figure 17) representing a discussion, which contains at least the names of the learners (e.g., Name column) and their postings (e.g., Thread column).

![Figure 17. A sample datafile.](image)

This file is exported in a .csv format, e.g., IAM-RAW-Data.csv, and read into R with code similar to Table 2. The code also collapses IAM subphases into the five major phases.
Four analyses are typically run on the data: word-frequency, cluster, sentiment, and social network. We focus on last three types in this paper.

**Cluster Analysis**

Hierarchical clustering is performed using the default “Euclidean” distance algorithm, and plotted as a dendrogram. Table 3 shows the R-code for clustering and generating this dendrogram.

```r
# Hierarchical Clustering: Dendrogram
library(tm)
thread=df$Thread
dtm=DocumentTermMatrix(Corpus(VectorSource(thread)))
mat=as.matrix(dtm)
d=dist(mat) # default is Euclidean distance
h=hclust(d) # perform hierarchical clustering
plot(h) # plot dendrogram
```

**Sentiment Analysis**

R contains built-in libraries for doing lexical-based sentiment analysis. However, this study used three custom lexica representing positive words, negative words, and social presence words. The R-code for importing
these three different lexica, counting their occurrences in each posting, and generating a frequency bar graph, is shown in Table 4.

```r
Positive.Lexicon=readLines("P-Words.csv")
Negative.Lexicon=readLines("N-Words.csv")
Presence.Lexicon=readLines("S-Words.csv")
thread=df$Thread
lexicon.scores=matrix(ncol=3,nrow=0)
for (post in thread) {
  positive.score=0
  for (phrase in Positive.Lexicon) {
    phrase=gsub("\[*\]", "\\"\", phrase)
    phrase=gsub("\[+\]", "\\"\", phrase)
    phrase=gsub("\[-\]", "\\"\", phrase)
    phrase=paste("\b",phrase,"\b",sep="")
    if (grepl(phrase,post,ignore.case=T)) positive.score=positive.score+1
  }
  negative.score=0
  for (phrase in Negative.Lexicon) {
    phrase=gsub("\[*\]", "\\"\", phrase)
    phrase=gsub("\[+\]", "\\"\", phrase)
    phrase=gsub("\[-\]", "\\"\", phrase)
    phrase=paste("\b",phrase,"\b",sep="")
    if (grepl(phrase,post,ignore.case=T)) negative.score=negative.score+1
  }
  presence.score=0
  for (phrase in Presence.Lexicon) {
    phrase=gsub("\[*\]", "\\"\", phrase)
    phrase=gsub("\[+\]", "\\"\", phrase)
    phrase=gsub("\[-\]", "\\"\", phrase)
    phrase=paste("\b",phrase,"\b",sep="")
    if (grepl(phrase,post,ignore.case=T)) presence.score=presence.score+1
  }
  lexicon.scores=rbind(lexicon.scores,c(positive.score,negative.score,presence.score))
}
dat=rbind(lexicon.scores[,"positive"],lexicon.scores[,"negative"],lexicon.scores[,"presence"])
rownames(dat)=c("Positive", "Negative", "Presence")
barplot(dat,beside=T, names=1:length(df$Thread), legend=TRUE)
title("Positive, Negative, and Social Presence Scores")
```

Table 4. R-code to do a lexicon-based sentiment analysis. Three lexica are imported: Positive words, negative words, and social-presence words.

Social Network Analysis (SNA)

SNA was performed in two steps. Table 5 contains the R code for generating a table of social edges, where an edge represents who a speaker received information from.
Given a table of edges, Table 6 is the R-code for depicting these edges as a sociogram, and annotating the edges with the IAM phases.

```r
library(igraph)
edf=read.csv("edges.csv")
g=graph_from_data_frame(edf) # Read graph

in.degree=degree(g, mode="in") # Calculate degree
out.degree=degree(g, mode="out")
between=betweenness(g)
ug=as.undirected(simplify(g))
gr=cluster_fast_greedy(ug)
#gr=cluster_edge_betweenness(ug)

V(g)$size=strength(g) # plot
V(g)$color=groups$membership

set.seed(777)
plot(g,layout=layout_with_fr(g),vertex.label.cex=.75,edge.label.cex=.5,edge.arrow.size=.5)
set.seed(777)
plot(gr,g,layout=layout_with_fr(g),vertex.label.cex=.75,edge.label.cex=.5,edge.arrow.size=.5)
```

Table 6. R-code for generating sociograms.
SLAMs in an informal online environment

This portion of the study will illustrate how SLAMs apply to an informal learning environment using a #BlackLivesMatter Twitter dataset collected during the Freddie Gray demonstrations from April 21 – April 28, 2015. 45,646 tweets were collected during this timeframe.

OILS Twitter Scraper
Analyzing the informal learning environment begins by using the OILS Twitter Scraper to scrape unstructured tweets from Twitter from April 21-28, 2015 using the Twitter API. The OILS Twitter Scraper is an Excel-based tool written in Visual Basic by Flor (2014).

SCK Lexica Development
After scraping the data, the process moved to the development of lexica. Two common methods for creating lexica are a manual approach in which words are coded and added to the appropriate list by the researcher and a dictionary approach in which words are added according to their relationship to established words with positive or negative sentiment in the dataset as determined by an online dictionary (Liu, 2012). The manual approach involves a content analysis (Krippendorff, 1980) which is performed by manually reading text and classifying the text by hand according to a research framework. Content analysis was performed on all of the tweets from April 21st and 25th to establish a foundational lexicon. Coding was performed using an Excel spreadsheet with columns for all of the IAM phases and sub-phases like the one presented in Figure 1. The words identified in the manual approach enable the dictionary approach in which all words in the initial lexicon were found in the online dictionary WordNet (Miller, Beckwith, Fellbaum, Gross, & Miller, 1990). During the search, synonyms that did not fit the original context of a given word were removed while those that fit the context were added to the lexica. The final product of this process is a list of words and phrases according to each IAM phase that originate in the Twitter data used for this study.

Sentiment Analysis
The complete lists of words and phrases was added to routines in the OILS Twitter Scraper to automatically produce counts of the most frequently occurring words and phrases for each day in the dataset and to determine the presence of IAM phases in the data.
Results

Research Question 1

Cluster Analysis

Figure 18 depicts the dendrogram from the hierarchical clustering of the discussion thread. It is apparent that posting 25 is the most dissimilar. Similar postings include (10, 4, 31; leftmost cluster), (7, 8; rightmost cluster), and (13, 35; lowest cluster).

Sentiment Analysis

Figure 19 depicts a bar chart for the sentiment and social presence analysis. High positive, negative, or presence scores indicate areas of focus for the analyst. The bar chart shows that posting 25, which was the most dissimilar in the clustering analysis, was also the posting with the highest positive, negative, and presence scores.
Social Network Analysis (SNA)

The SNA (see Figure 20) found three main cliques of users depicted by three differently-shaded clouds. Within the cliques, the most influential users (shown as bigger circles) appear to be associated with higher levels of IAM as denoted in the edge labels. By annotating the edge labels with IAM phases, the analyst can explore relationships between influence, interactions, and learning.
Research Question 2

Sentiment Analysis

The sentiment analysis results for the #Blacklivesmatter dataset are presented in Figure 21 organized by each day in the dataset.

The sentiment analysis counted the number of unigrams and bigrams that were exemplars of the given IAM phase in each sample. Note that each sample tweet can include more than one instance of a given phase or phases. The sentiment analysis shows that phase I/A was the most frequent of all the IAM phases. According to percentages, the proportion of phase I/A codes remains fairly consistent over the course of the 8-day dataset. Phase I/C and phase I/E were the most frequent following phase I/A. Excluding the content analysis days (21st and 25th), levels of phase I/C and phase I/E also illustrated a large degree of consistency ranging between 16% and 9% for phase I/C and 12% and 8% for phase I/E. Such consistency suggests that although the lexicon analysis does not account for all of the data, it consistently identifies SCK in this dataset.

Discussion

An important goal for researchers studying SCK — in either formal or informal online learning environments — is to understand the dynamics that support SCK. These dynamics include the changes in the phases of knowledge construction over time, and the social groups that form serendipitously during extended
discourse. These changes are difficult or tedious to characterize manually, and SLAMs can help automate both the detection and visualization of these social dynamics. In the first study, cluster analysis, sentiment analysis, and social network analysis were performed on a discussion board thread. The cluster analysis showed postings which were similar based on word choice. The sentiment analysis portrayed changes in attitude towards the discussion topic, and changes in social presence. Finally, the social network analysis depicted the exchange of information, the implicit groups that formed based on this exchange, and the phases of knowledge construction associated with the exchanges.

One can combine the findings from these three analyses to form hypotheses for further analysis, or to design instructional interventions prior to the end of a course. An example of a hypothesis based on these analyses would be: postings that are different (e.g., posting 25 in Figure 18), with high positive sentiment and high social presences scores (e.g., posting 25 by subject Lex in Figure 19) can help others reach higher phases of knowledge construction (e.g., subjects Betty & Kerry, rightmost group in Figure 20). An example of an instructional intervention based on these analyses would be to place students in three groups, as indicated by the sociogram in Figure 20, but to put the top influencers in different groups.

The utility of SLAMs is particularly evident when studying SCK and social dynamics in massive online groups — where traditional content analyses would be prohibitively expensive in both time and money. The second study demonstrated that SCK can be found in the #BlackLivesMatter network of practice. Sentiment analysis was able to identify SCK in the dataset at varying levels. Overall, the IAM framework identified that SCK occurred mostly in phase I as many examples of sharing opinions and providing examples were found. Interestingly, the rates at which data were coded by the SCK lexicon were fairly consistent suggesting that as people voluntarily contributed to the discussion, they continued common threads and described them using similar language. The SCK lexicon performed well for specific topics that were present on both of the content analysis days.

Many of the previous studies conducted using the IAM have failed to identify higher phases of knowledge construction (Paulus, 2007). For the most part, this study is no exception because the majority of the samples were either in phase 1/A or phase 1/C indicating that higher phases of knowledge construction did not take place. One potential explanation for this is provided by (Gunawardena, Lowe, & Anderson, 1998, August) who write that dissonance is not always needed to build knowledge because the people coming into a given discussion realize they are on the same page conceptually speaking and therefore accept statements made by others instead of disagreeing and sparking productive conflict.
Conclusion

Traditional content analysis can be prohibitively time consuming when applied to massive amounts of online data, or to data rich in higher phases of knowledge construction. SLAMs provide researchers a host of semi-automated techniques for making explicit many of the tacit structures and processes that underlie the social construction of knowledge.

References


