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Prof. Dr. Emine Demiray, Anadolu University, Turkey
Postal address: Anadolu University, Open Education Faculty
Yunusemre Campus 26470 Eskisehir-TURKEY
Tel: +90 (222) 335 05 80 ext.5829
Fax:+90 (222) 320 45 20
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Owner of the int.WOJDE
Prof. Dr. Emine DEMIRAY

Postal Address:
Anadolu University, Open Education Faculty, Yunusemre Campus 26470 Eskisehir-TURKEY
Phone: +90 222 335 0581 ext. 5829, Fax:+90 (222) 320 45 20
E-mails: intwojde@gmail.com or edemiray@anadolu.edu.tr

Executive Editor
Lecturer Dr. Ufuk TANYERI

Postal Address:
Ankara University, 06920 Nallihan, Ankara TURKEY
Email: ufuktanyeri@ankara.edu.tr

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From the Editor

Dear readers of intWOJDE

Dear readers of intWOJDE

We present our Volume: 13, Number: 1 issue to our valuable readers.

In this issue, there are three articles. We are also publishing an article under the title of "special article/s" for the first time in this issue. In our next issues, in addition to the main theme of our journal, women and distance education, we would like to include article/s that we believe will contribute to the field of distance education under the title of special article/s. We thank our authors for their valuable contributions to our journal.

The first article prepared by Lyndsay JOHNSON and Dr. Norine WARK and entitled "Mitigating the Matilda Effect on Arlene M. C. Young: Celebrating Her Pioneering Influence in Counselling and Social Justice in Distance Education". This paper highlights the transformative impact of Arlene M. C. Young, from her role as a counsellor to that of a professor, while tirelessly serving as a stalwart advocate for social justice and gender inclusivity in distance education.

The second article entitled is "Mitigating the Matilda Effect on Erin M. Keough: Collective Practice for A Common Good in Open and Distance Education" written by Dr. Peggy Lynn MacIsaac and Dr. Susan BAINBRIDGE. As part of series to mitigate the Matilda Effect of women's achievements being falsely attributed to men, this article discusses the open and distance education work of Erin M.

The other article entitled is "Multiple Content Analysis Models for Analyzing Higher Order Thinking Development in Online Forums" written by Dr. Hiroshi MIYASHITA and Dr. Norine WARK. This article explores asynchronous transcripts from an action research study to determine whether or how multiple content analysis instruments can effectively assess the development of higher order thinking.

We would be very happy to publish your studies on women and distance education in our journal. We hope to stay in touch and wish to meet in our next Issue, on October 2024.

Cordially,

Prof. Dr. Emine DEMIRAY
Editor in Chief

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MITIGATING THE MATILDA EFFECT ON ARLENE M. C. YOUNG: CELEBRATING HER PIONEERING INFLUENCE IN COUNSELLING AND SOCIAL JUSTICE IN DISTANCE EDUCATION

Lyndsay JOHNSON
ljohnson25@learn.athabascau.ca
Athabasca University, Canada

Norine WARK
norinewark@gmail.com
Education, Technology, & Research Consultant, Canada

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ABSTRACT

The *Matilda Effect* shines a revealing light on the widespread inclination to disregard, belittle, or marginalize women, depriving them of the recognition, credit, and inclusion they rightfully deserve in their professional fields and academic research. In short, it pertains to the systemic undervaluing of women's achievements within scientific domains (Rossiter, 1993). This paper highlights the transformative impact of Arlene M. C. Young, from her role as a counsellor to that of a professor, while tirelessly serving as a stalwart advocate for social justice and gender inclusivity in distance education. Young's biographical profile, encompassing her educational journey and notable publications, is acknowledged, leading to an examination of three select pieces that she authored.

Keywords: Matilda Effect, distance education, women's research, online learning, social justice, assertiveness, counselling, Arlene M. C. Young

INTRODUCTION

In this paper, I explain the Matilda Effect and profile Arlene M. C. Young, a woman who made remarkable contributions to women's empowerment in distance education (DE) throughout her career. I provide her biographical background, share her work, and then review three pieces of her published contributions to DE.

Embracing the insights within this paper is but one step toward advancing our roles as educators and researchers in the 21st century, fostering awareness of the invaluable contributions made by women throughout history. This leads us to the remarkable work of Susan Bainbridge and Norine Wark, whose encyclopedia was developed "to capture and share the voices and contributions of female pioneers in online learning" (Bainbridge & Wark, 2022, p. 3). I vividly recall Susan's revelation during a cohort meeting for one of my Masters' courses. She said that neither she nor Norine had set out to compile an encyclopedia. Nevertheless, their years of meticulous research and unwavering dedication culminated in a captivating tribute to the women of DE. Through their book and subsequent publications and presentations, they share the stories of women who had been unfairly marginalized by the *Matilda Effect*. It is my hope that this article can serve to further illuminate the fine work and selfless dedication of one female pioneer, Arlene Young, and, in doing so, help to weaken the Matilda Effect in our field.

THE MATILDA EFFECT

The *Matilda Effect* illuminates the pervasive tendency to overlook, diminish, or exclude women from receiving due acknowledgment, credit, or inclusion in academic research and recognition within their respective fields. The term was coined by Rossiter (1993) when she drew attention to the Matilda Effect on women in science. Rossiter noted both contemporary and historical events where women were given "unequal credit for co-discoveries" (p. 328). In her research, Rossiter also noted that women were receiving honourary degrees and being declared *woman of the year,* which was "compensatory recognition for those women whom the mainstream prize committees had overlooked" (p. 330).

Rossiter (1993) coined the term, the Matilda Effect, after Matilda J. Gage, a nineteenth-century American suffragist and feminist critic who articulated this phenomenon. Similar to the struggles that Matilda J. Gage noted in her time, Rossiter (1993) recognized that, rather than denying women receive less attention and recognition for their contributions to a field, "the sexist nature of much of the women's systematic under-recognition should be acknowledged, noted and even high-lighted [sic]" (p. 337).

Considering the widespread influence of the Matilda Effect in science, technology, engineering, and mathematics (STEM), and social sciences, it is plausible to surmise that the field of DE is similarly affected by this phenomenon "due to the location of our field within the social sciences, and its reliance on computing and emerging technologies (Makarova et al., 2019; Schmidt et al., 2021)" (Bainbridge & Wark, 2022, p. 444). This hypothesis illuminates some of the research results documenting the female pioneers' cumulative challenges, accomplishments, and gender-related comments in Bainbridge and Wark's (2022) encyclopedia, including observations about the domination of men in leadership, administrative, and conference presentations.

What is the impact of not recognizing the contributions of women in DE?

Concerning the concept of positionality, the historical marginalization of women in academia may manifest within DE, leading to a lack of recognition for female pioneers and their invaluable contributions. Such oversight undermines the diversity and inclusivity of DE discourse and perpetuates systemic gender disparities.

In her interview, Young states, "I may not have made much by the way of contribution, but I certainly heard a lot of the discussions" (Bainbridge & Wark, 2022, p. 385). The silent, yet far-reaching contributions made by women like Young need to be recognized on a global scale. Whether achieved within a faculty or university community, such offerings hold profound significance. The impact of these contributions, though often unnoticed, resonate deeply with individuals. They may even prompt other women to realize their potential as well. At the very least, these contributions deserve celebration, remembrance, and acknowledgment.

BIOGRAPHICAL BACKGROUND

I have categorized Young's education and career milestones into two distinct sections: education and career. Each section is listed in chronological order. A proponent of overcoming barriers and developing techniques to allow students to succeed in DE, it is important to note that Young completed three monumental education programs at the University of Alberta (U of A) while working at Athabasca University (AU).

Education

1966: Bachelor of Arts in History and English, U of A

1984: Certificate in Educational Psychology, U of A

1987: Master of Education in Counselling Psychology, U of A

2003: Ph.D. in Educational Psychology, U of A

Career

1975: Supervisor in Personnel Services at AU

1977-1997: Counsellor at AU

1984-1985: Senior Counsellor at Northern Regional Office, AU

1987-1988: Acting Manager, Northern Regional Office, AU

1997: Associate Professor at AU

2003: Retired

2003 - 2015: Tutored students in Women's and Gender Studies (WGST) 266: Thinking Through Women's Lives and worked on the WGST 499: Applied Project at AU

Publication Timeline

Early Works: 1966 - 1987

1986: Young, A. (1986). *My experiences at an Open University summer school: An evaluation report for the London Regional Office*. Open University.

1987: Young, A. M. C. (1987). *The effects of an assertiveness training workshop for women on assertion and self-esteem* [Unpublished master's thesis]. University of Alberta.

Mid-Career: 1988 - 2002

1988: Young, A. M. C. (1988a). *The theme of nurturing in the counselling of women.* Women's International Network Newsletter.

1988: Young, A. M. C. (1988b). A renewed emphasis on nurturing in the counselling of women. *Developing distance education* (pp. 447–449). International Council for Distance Education.

1990: Young, A. (Ed.). (1990). *Coping with exam anxiety*. Athabasca University.

1994: Young, A., Hunter-Moffatt, R., & Oddson, L. (1994). *The Sunrise Project's success in extending Northern and First Nations education: An evaluation report for Athabasca University*.

1998: Young, A. (1998). *Student diary.* Athabasca University.

2000: Young, A. (2000). *University certificate: Counselling women*. Progress Report.

2001: Cavanaugh, C., Ellerman, E., Oddson, L., & Young, A. (2001). Lessons from our cyberclassroom. In E. J. Burge & M. Haughey (Eds.), *Using learning technologies: International perspectives on practice* (pp. 61–71). Routledge/Falmer.

Later Career: 2003 - Present

2003: Ph.D. in Educational Psychology Dissertation. Young, A. M. C. (2003). *Making sense of women's job loss experiences* [Unpublished doctoral dissertation]. University of Alberta.

2006: Young, A. (2006). *Selected study skills books in the AU Library: An annotated bibliography* (2nd ed.).

2010: Young, A. M. C. (2010). Telling stories to make sense of job loss. In L. R. Ross (Ed.), *Counselling women: Feminist issues, theory and practice.* Toronto Women's Press.

REVIEW OF WORK

In her interview (Bainbridge & Wark, 2022), Young acknowledges that, while she may not have a vast publication record, her profound impact on her students and her peers through counselling cannot be overstated. During the constant restructuring of the fledgling AU, the allocation of funding and human resources for student services and counselling was a tenuous subject. Arlene recalls:

> At one time, student services, and counselling in particular, were eliminated. It was struck out of the budget…I was still counselling students, but I was doing other things as well…but I still did counselling.
>
> I can still remember one supervisor said to me, "How many students are you counselling?"
>
> And I said, "Well, let me think about this for a moment. I'm not supposed to be doing any counselling, and you want me to give you statistics on how many students I'm counselling?"
>
> She looked sort of ashamed of herself and left. I thought, "Do you think I'm going to hang myself, for heaven's sake? No, I'm not." I just kept on doing what I was doing, and the staff referred people to me for counselling, so I just kept doing it. (Bainbridge & Wark, 2022, p. 387)

When selecting three of Arlene's works to review, I chose those that illuminate her core research focus: addressing issues affecting women in DE. For these reasons, I have reviewed her Master's thesis on *The Effects of an Assertiveness Training Workshop for Women on Assertion and Self-Esteem* (1987), her co-authored book chapter on using learning technologies in online education, *Lessons from Our Cyberclassroom* (Cavanaugh et al., 2001), and her Ph.D. dissertation, *Making Sense of Women's Job Loss Experiences* (2003).

Master of Education in Counselling Psychology Thesis (Young, 1987)

Summary of Research

In her M.Ed. thesis, Young (1987) completed a formative evaluation of the assertiveness training workshop for women offered at AU. She found that women who completed the program reported increased assertiveness and self-esteem (Young, 1987).

In university programs, assertiveness workshops aim to "teach assertiveness concepts to women, to help them acquire assertive behaviour skills, and to reduce their anxiety about using those skills" (Young, 1987, p. 1). Young's dissertation includes a lengthy review of related literature on assertiveness training for women and program evaluation, with a focus on the areas of feminist theory, research findings, and literature that had the greatest impact.

Young's method and procedure for this study was to host a workshop on two successive Saturdays. The workshops consisted of lectures, role-playing, small-group coaching, and large-group discussions. In total, 17 women enrolled at AU from the Edmonton, Alberta area attended both workshops.

The data was collected via self-report inventories, specifically the Gambrill-Richey Assertion Inventory (Gambrill & Richey, 1975) and the Coopersmith Self-Esteem Inventory (CSEI, Coopersmith, 1981), and questionnaires immediately following the workshop. Two months after its completion. Young conducted a quantitative and qualitative analysis of the data that was collected and analyzed it thoroughly, as noted in her section on data analysis. The findings and conclusions of her research stated that she utilized *Stats Plus* computer software to analyze the data.

To summarize, "the analysis of the data indicated that the Assertiveness Training for Women Workshop was valuable for the subjects" (Young, 1987, p. 42). Young concluded that the workshop achieved its intended effect and met "the expectations of both the trainers and the participants" (p. 45).

Impression of the Research

Young's research could be used to improve future workshops, especially her findings in the qualitative data. "As predicted, subjects found some topics and approaches more useful than others but the specific subjects mentioned as particularly useful varied greatly between individuals" (Young, 1987, pp. 46-47).

I did not conduct any further research to see if her recommendations were considered for future assertiveness training workshops. Because of her positionality and extensive work experience, her research could have a profound impact on the quality of the workshops in helping women to increase their assertiveness. I did a brief search on the AU website, but could not find any current offerings for assertiveness training. In the three decades since her research, this topic seems to have faded away. Nevertheless, recent research in corporate (Exley & Kesler, 2019; Guillén et al., 2017; Lindeman et al., 2018) and academic (Bainbridge & Wark, 2022; King et al., 2017; Lincoln et al., 2020; Makarova et al., 2019; Miller et al., 2014; Nosek et al., 2009; National Science Foundation, 2015a, 2015b; Schmidt et al., 2021; Storage et al., 2020) fields suggest that such training continues to be critical for women's success in these fields.

Book Chapter: Lessons from our Cyberclassroom (Cavanaugh et al., 2001)

Summary of Research

This book chapter was a collaboration between Young and three of her coworkers who "welcomed the invitation to contribute to this book as an opportunity to reflect more systematically on a subject that is making a significant impact on our work and teaching practice" (Cavanaugh et al., 2001, p. 61). The chapter focused on three conversations that the women had in person, which were recorded and transcribed. The authors then communicated via e-mail and file sharing to complete the project (Cavanaugh et al., 2001). The women used the chapter to focus on "what we see as the gap between the promise of the technology and our experiences with it; our shifting roles as teachers in a computer-mediated learning environment; and the impact of computer technologies on working conditions and…our students" (Cavanaugh et al., 2001, p. 62).

The chapter provides detailed explanations of the women discussing their experiences working with emerging technologies. They explore the implications of technological advancements, noting how technology can exacerbate disparities for individuals, especially women, who lack access to computers, modems, and the internet.

Their chapter culminates in a comprehensive list of recommendations tailored for institutions, educators, instructors, tutors, and students. These suggestions are rooted in their values and practical expertise, offering strategic insights on tackling global challenges within the cyber classroom.

Impression of the Research

The women are pioneers in a shift in DE technology. "We reject the business model of education…and we support a collaborative model where students and instructions produce knowledge and seek change interactively and democratically" (Cavanaugh et al., 2001, p. 69). Their unique position offers a distinctive lens through which to examine the impact of technological advancements over the past four decades on women in DE. They recognize that the technology used to communicate influences how they interact (Cavanaugh et al., 2001, p. 65). What would they think of how courses, such as "Gender Issues in Distance Education," or all of the other AU courses, are run today?

I find that this book chapter has stood the test of time admirably; its relevance persists even today, and its content feels as if it were published within the last five years, thus maintaining its global significance.

Ph.D. in Educational Psychology Dissertation (Young, 2003)

Summary of Research

For her dissertation research, Young (2003) examined women's job loss experience from a feminist perspective, focusing on professionals in Alberta in the late 1990s. Young (2003) described her passion for and firsthand encounters with job loss, which became the foundation for her research. "As a result of my experience in organizational restructuring, I changed career direction…my close brush with job loss, despite its positive outcome, prompted me to wonder what women experienced when they lost their jobs" (Young, 2003, p. 17).

To conduct her research, Young meticulously undertook three qualitative case studies, refining her thesis through iterative exploration and insightful synthesis as she uncovered connections and deepened her investigation.

Young provided in-depth research in the form of case studies of three women. She explored the physical, emotional, and psychological challenges and changes that the women went through when they lost their jobs. Much discussion was focused on the identity and self-esteem of the women, and the domino effect that losing their jobs had on their lives. "Each woman was able to keep going after her job loss because she found hope for the future and a purpose for living" (Young, 2003, p. 129).

In conclusion, Young (2003) acknowledged the time and energy that the women put into their interviews with her. She recognized that there are many ways to lose a job and just as many ways to react to it. In a thought-provoking declaration, Young (2003) stated:

> **Our work structures our time, gives us something meaningful to do, assigns us a status, allows us to engage with people outside of our families, and pursue collective goals. The loss of jobs with good pay and benefits threatens to leave many of us psychologically wanting." (p. 130)**

Impression of the Research

I perceive Ph.D. dissertations as deeply personal research endeavours focused on topics that hold profound significance for the researcher. Young offers a distinctive viewpoint on the subject matter, rooted in feminist principles that serve as the cornerstone of her research, illuminating overlooked facets and advocating for inclusive perspectives in scholarly discourse. I appreciate the link to the feminist theory, "questioning and analyzing gender and social relationships to observe and bring to the surface what has formerly been taken for granted is central to the feminist theory" (Loesen, 1994; Stanley, 1993, 1997; Stanley & Wise, 1990, as cited by Young, 2003, p. 18).

CONCLUSION

In conclusion, this paper has profiled and summarized the accomplishments of Arlene M. C. Young in the field of distance education. Drawing upon her subjective experiences, fueled by a fervent commitment to advancing social justice for women within distance education contexts, Young's remarkable accomplishments demand acknowledgment and celebration. Apart from her inclusion in *The Encyclopedia of Female Pioneers in Online Learning* (Bainbridge & Wark, 2022), scant details about Arlene Young are available online. Despite her pioneering contributions to the counselling department at AU, particularly in spearheading assertiveness training initiatives, the current AU website fails to recognize her significant achievements. I assert that this provides supplementary evidence of the Matilda Effect within the realm of distance education.

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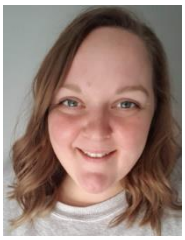
BIODATA and CONTACT ADDRESS of the AUTHORS



Lyndsay JOHNSON (she/her) is an Instructional Designer with the Department of National Defence in Kingston, Ontario. She is pursuing a Master of Education in Open, Digital and Distance Education through Athabasca University. She holds a BA in History from Queen's University. Her academic interests include the intersection of technology and adult learning, with a focus on enhancing accessibility and implementation strategies. She specializes in training development and has a passion for designing online and hybrid courses tailored for effective learning experiences.

Johnson, Lyndsay
Athabasca University
Address: 1 University Drive, Athabasca, AB Canada T9S 3A3
Email: ljohnson25@learn.athabascau.ca

Dr. Norine WARK is an award-winning scholar, educator, researcher, and writer, currently working as a freelance educational consultant, researcher, writer, grant writer, and editor in the field of distance education. Norine's Doctor of Education in Distance Education (2018) and Master of Education in Distance Education (2005) were obtained from Athabasca University. Her Bachelor of Education (5 yr.; 1997) and teaching certificate (1991) came from Simon Fraser University. Norine's research focuses upon historic and emerging theory and practice in distance learning, as well as the technologies that enable such learning.

Wark, Norine (Dr.)
Address: RR 1, S6, C5, Dawson Creek BC Canada V1G 4E7
Phone: 1-250-843-7310
E-mail: norinewark@gmail.com

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MITIGATING THE MATILDA EFFECT ON ERIN M. KEOUGH: COLLECTIVE PRACTICE FOR A COMMON GOOD IN OPEN AND DISTANCE EDUCATION

Peggy Lynn MACISAAC
plm2030@gmail.com
Peggy Lynn MacIsaac Consulting, Canada

Susan BAINBRIDGE
susanbainbridge@athabascau.ca
Athabasca University, Canada

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ABSTRACT

As part of series to mitigate the Matilda Effect of women's achievements being falsely attributed to men, this article discusses the open and distance education work of Erin M. Keough through the lens of education as a social common good. Keough's work connects formal and informal education practices with social, economic, educational, and information communication technological policies. Keough advocates that open and distance education leaders are well positioned to collaborate across these four policy areas. Specific examples are drawn from projects based in Newfoundland and Labrador, across various other regions in Canada, and non-Canadian locations. These examples illuminate: the challenges and successes of policy making in an environment of rapidly changing information communication technologies; historic changes of open and distance education from using satellites to high-speed broadband networks; the strength of multi-disciplinary collaborative networks; the impact of open and distance education to connect geographically isolated people; and the social justice of open and distance education being designed to counteract the isolation of women to the home.

Keywords: Erin M. Keough, mitigating Matilda Effect, policy making, social justice, distance education history, open learning history, information and communications technology networks, telemedicine

INTRODUCTION

This article is written in 2023, a time in which objectivity in public discourse has diminished and the idea of a *common good* does not have a prevailing agreed definition. For this article common good will be used to mean, in the broadest most inclusive sense, something that serves the greatest number of persons in a social community while explicitly acknowledging if anyone is not served because they are less privileged. In short, a common good serves a social need. If we consider information as a common good, then the technologies to foster humans sharing that common good can be utilized with a sense of purpose to a social contract. This article explores examples of this from the work of Erin M. Keough, a pioneer in the field of open and distance education. Keough's initiatives demonstrate the successes of working collectively to achieve a common good in open and distance education in Canada and around the world.

This article is part of a series to mitigate the Matilda Effect. The Matilda Effect was coined by Margaret Rossiter in the 1993 essay titled, *The ~~Matthew~~ Matilda Effect in Science* [strikethrough in original title]. Rossiter gave this name to the century's old phenomenon of women's achievements in science being falsely attributed to their male colleagues. It was named after Matilda Joslyn Gage whose first recorded writing on the phenomenon of

ignoring women's achievements in science was printed in an 1870 woman suffrage tract titled, *Woman as Inventor*. While extolling the origin stories of specific scientific inventions, such as correctly attributing the design of the cotton gin to Mrs. Catharine Greene, Gage roots the critique of the phenomenon within the social morays and the prescribed limits of women's employment at the time of invention. Gage describes women of her time (the late 1800s) as being taught from earliest childhood, that to make use of inventive genius talent "would be an outrage against society," exposing the women inventors to ridicule and harsh treatment for displaying superior arrogance (Gage, 1870, p. 6). Today, 30 years after Rossiter coined the term, and more than 150 years since Gage's publication, the Matilda Effect continues to be documented by researchers and historians in the sciences and more broadly across other academic disciplines. Contributing to the mitigation of the Matilda Effect, this series of articles highlights the work of women in open and distance education, with this article's focus highlighting the pioneering work of Erin M. Keough through the lens of education as a social common good.

From the many facets of Keough's published works, this article highlights four aspects. They are social considerations, learner isolation, collaboration, and policy-making in open and distance education. This article echoes Keough's vivid example and situates discussions of these four aspects within the details of practice.

SOCIAL ELEMENTS

Keough's work in distance education began at the most easterly point in North America, the Canadian maritime province of Newfoundland (an island) and Labrador (the mainland). In the *Encyclopedia of Female Pioneers in Online Learning,* the interview-chapter about Erin M. Keough provides an up-close retelling of those beginnings and the experiences in the developing satellite communication for distance education in this region, as rooted in actions to support the social common good of information and the pursuit of knowledge (Bainbridge & Wark, 2023, pp. 234-251). The initial call for proposals to use the Hermes satellite required that the projects be grounded in "social purposes" (p. 237). The two projects approved for satellite use (which would provide one-way video, and two-way audio communication anywhere in the province) were "to help make centralised education and health resources more accessible to people living in rural communities" (Taylor & Keough, 1995, p. 355). These two would continue to be the lynch pins for the growth of satellite-based learning and evolution into online learning in the region. This evolution was fostered by cross-pollination of innovation in formal and non-formal education.

Keough writes about one of those spin-off telecommunication initiatives, called the Women's Economic Network, and connects the innovation use within the social-economic milieu of the time. Here is that context. Newfoundland and Labrador is a sparsely populated rocky region of mainly small rural communities, which for several centuries were dependent on the cod-fishing industry for basic livelihood. "Historically, women had assumed responsibility for the community for extended periods when men were away fishing" (Taylor & Keough, 1995, p. 356). In 1992, a moratorium on cod-fishing ended this commercial fishing industry, changing the rhythm of male seasonal work which, in turn, affected the gendered roles of community leadership because men were no longer "away" for long periods of time. The Women's Economic Network, developed "partly as a response to the crises in the fishing industry," challenged community norms, and focused on social change at the individual and community level as well as at the policy level of provincial and federal governments (Taylor & Keough, 1995, pp. 355-356).

In the 1988 book titled, *Toward New Horizons for Women in Distance Education: International Perspective*, Erin M. Keough collaborated with Diana R. Carl and Lorraine Y.

Bourque about their experiences as distance educators and policy makers serving female learners in a chapter called *Atlantic Canada Perspectives*, with each author writing a separate section. Reflecting on the provision of distance education to female learners in a broadcast form, Carl (1988) wrote:

> **Distance education… should not reinforce the ghettoization of women confined to the home.… Women [were] encouraged to learn in groups, and to support each other; course assignments required students to access resources within the community. The community, then, [was] viewed as a resource for their education. (p. 110)**

Bourque (1988), in that same chapter, also warned against distance education becoming a "women's ghetto" (p. 119). Bourque envisioned that women would remain the driving force, shaping the future of distance education (p. 119). This documents a continued hope, which is aligned with what Gage (1870) championed, that women's pursuit of knowledge is a "freedom from some congenial occupation outside of the prescribed limits" (Gage, 1870, p. 7).

CONNECTING IN ISOLATION

Educators choose open and distance learning for many reasons. Keough wrote that this field addressed the isolation of the learners, acknowledging that isolation is "only viable for a few" (Keough, 1996, p. 95). In the Newfoundland and Labrador projects, telecommunication technology was used initially to deliver educational programming and then was expanded to host community group meetings. The intention behind this was to "decrease the sense of isolation" felt by learners and community members across the region (Keough, 1988, p. 116). A telemedicine satellite links project between Canada, Kenya, and Uganda, served the needs of geographically isolated physicians in all three countries (House et al., 1987, p. 398). Understanding that human connections strengthen communities, Keough expressed the hope of utilizing open and distance education "to decrease the feeling of isolation of professionals and others living in small or remote communities and thus encourage people to stay there longer. That was really our driving force" (Bainbridge & Wark, 2023, p. 244).

EXPANDING INTERNATIONALLY

Following the successes of collaborative networking models of telecommunication for distance education within rural Canada (Keough et al., 1995), Keough transitioned to applying what was learned in Canada to non-Canadian countries. An article, co-authored by Keough, reported on the use of satellite telecommunication for continuing medical education between physicians in Canada, Kenya, and Uganda (House, et al., 1987, p. 398). Keough and the other authors described the reasons for this initiative at that time as,

> **there are many similarities between the medical practice in East Africa and in rural Canada. Physicians in Kenya and Uganda are for the most part, isolated from their academic colleagues… travel is difficult, medical meetings are infrequent and contact with academic colleagues is sporadic at best. (p. 398)**

It is worth noting the importance of the approach taken in this tri-country initiative. While imbalances of power and oppression within education exist in general (Freire, 1968/1993), international development initiatives in education can unwittingly marginalize learners by recreating colonial power dichotomies (MacIsaac, 2021, pp. 28-29). Keough and the co-authors reported that this initiative was not a straight Canadian export of expertise. It was a reciprocal learning opportunity for counterparts in all three

countries, Canada, Kenya, and Uganda. Explicitly, they reported that the Canadians, even though they were the experts, expanded their knowledge of information and communications technology from their participation in the initiative (House et al., 1987, p. 400). This is an example of the evolution of the innovative use of satellite communication for education in rural Newfoundland and Labrador, being shared for use in structurally similar non-Canadian locations. Keough's international work involved Brazil, Chile, Dominica, India, Ireland, Jamaica, Japan, the Philippines, St. Vincent/the Grenadines, Senegal, South Africa, Tanzania, Uganda, and the United States of America (Bainbridge & Wark, 2023, pp. 246-249).

COLLABORATING TO SUPPORT A SOCIAL CONTRACT

Keough's distance education practice began with improving access to education and social services throughout the sparsely populated province of Newfoundland and Labrador, truly borne of a need to fulfill, in Keough's own words, a "social contract" of making public resources and social services more accessible to geographically isolated communities (Bainbridge & Wark, 2023, pp. 243-244). Recognizing that no single organization had the resources to serve that need, solutions were sought through the collaboration of multiple organizations from educational, governmental, and financial sectors. Collaborative projects were accomplished while holding steadfast to two foci. One was to understand to the rapidly evolving social-economic-cultural contexts of distance education and technology. The other was to formulate how public policy impacts this very dynamic environment while respecting the values of learners and instructors (Keough, 1996, p. 1).

Innovation in open and distance education means being open to the possibilities of using new and emerging technologies to serve an educational purpose. Examples will be used illustrating three impacted groups: female learners, technicians, and funders. The first example of this was the use of teleconferencing to maintain the previously mentioned Women's Economic Network. Connecting geographically isolated women in this way gave them agency (a) to support each other on a practical level and (b) to respond collectively to provincial and federal economic initiatives on a public policy level (Taylor & Keough, 1995, p. 358). Taylor and Keough explored how attempts to address social and economic concerns of communities unfortunately can become fragmented, focusing on single issues resulting in the marginalization of those who are both experiencing the concerns and working to resolve them (p. 358). They advocated, instead, for a holistic approach to address the underlying systemic causes, "including the transformation of belief systems which perpetuate poverty, powerlessness, and violence and which appear to be embedded in the structures of communities, especially (but by no means exclusively) in Western societies" (p. 358).

The second example of this openness to create something new in this field involves the way Keough cultivated relationships with Canadian telecommunication companies to build educational networks (Bainbridge & Wark, 2023, p. 246). The companies would make the sales staff available for consultation, but their views were limited to offering the existing uses of technology. Instead, Keough reached out to the technicians and engineers in order to generate the potential to design new uses of technologies. This rapport was so strong that the Canadian engineers were included on Keough's non-Canadian projects.

Keough's empathy for funders is shown in the third example. Keough's work as a pioneer in the field of open and distance education meant creating something new. Let us consider three elements of creating something new in open and distance education. One element was striving for a new way to serve learners' otherwise unmet needs. Another was designing new information and communications technologies to accomplish that aim.

And yet another was securing funding to make it happen. These are purposely not numbered in this article, as they are mutually interdependent without a prescribed order. Innovation of any of these elements can be hindered by naysayers, unable to envision an untried path as possible. Keough understood that funders have prescribed limits within which to work, describing it as follows:

> **When you are attempting something new or pushing boundaries, it is not easy for funders (private foundations, international agencies like CIDA [Canadian International Development Agency] or the World Bank, or various government departments) to place your request/interest within their establish[ed] guidelines. Not that people were unwilling; it was sometimes a challenge, that's all. (Bainbridge & Wark, 2023, p. 246)**

The ability to operationalize an innovation in open and distance education requires collaboration between those who are willing to imagine a way that does not yet exist.

PRACTICE INFORMED POLICY MAKING

Keough's work in public and private policy development has been responsive to the series of rapid changes in information communication technologies in the late 20th and early 21st centuries. Roberts, Keough, and Pacey (2001) posited, "the public policy literature is not, we believe, familiar to many of our colleagues in open and distance education" (p. 35). Befittingly, we shine a light on Keough's advice for open and distance education policy-making. We chose three publications (Keough, 1996; Pacey & Keough, 2003; Roberts et al., 2001) selected because they contained closely related ideas, extracted their advice for policy-making, removed the context specific details, merged related concepts, and synthesized the advice into a cohesive set. We present our synthesis in the following three paragraphs and use superscript numbers to cite each publication as follows: (1) Keough, 1996 (2) Pacey & Keough, 2003, (3) Roberts et al., 2001.

Open and distance educators work at the intersection of public and institutional policies that affect education, economic development, and information communication technologies. [2, 3] This interplay is complex without a single formula for distance educators to use to navigate policy making in this environment. [1, 3] Open and distance educators who are aware of the avenues of policy influence available to them, [1, 2] analyze the key policy drivers, [3] monitor the policy landscape, [1, 2, 3] and provide input early are well positioned to shape the environment instead of only reacting to it. [2, 3]

Specific recommendations for open and distance education leaders include: (a) becoming more informed about the technical process of policy development; [3] (b) understanding fully the various stakeholder groups, their roles, and the structures through which they are consulted; [1, 3] (c) monitoring policy processes; [1, 3] (d) being clear about desired outcomes for the field and practice; [1, 2, 3] and (e) anticipating the linkage between social, educational, financial, and telecommunications policies.[2, 3] To that last point, an additional advisement is to include paying attention to the economic agenda at the start of the process for a more holistic approach. [3] More often than not the educational, social, and information communication technologies are the primary focus with the economic concerns being addressed secondarily. [2, 3]

The three publications (Keough, 1996; Pacey & Keough, 2003; Roberts et al., 2001) champion the role of open and distance educators to provide balance to the public policy process because they have the ability to navigate a multitude of different structures and

foster cohesion. The challenges are to understand the basic elements of a policy framework, [1, 2, 3] to adjust to an increasing pace of changes with a decreasing timeframe to develop appropriate policies, [1, 2, 3] and to create new organizational structures that can function effectively in a globally networked society. [3] These three articles support that open and distance educators can be effective policy change agents at the institutional and governmental levels.

CHANGING ROLES AND POLICIES

A particular niche role emerged from Keough's direct experiences innovating in open and distance education and informing public policy to support it. Keough described that role was "to be the middle person between the technical teams and the bureaucrats who, in turn, had to keep the ministers informed and on board, as they made the funding decisions" (Bainbridge & Wark, 2023, p. 248). This is a role that continues to be well suited to open and distance education leaders.

Creating something new in the sand sometimes means building a new sandbox. Using new and emerging technologies to connect learners and instructors can necessitate changing the policies of private sector information and communication companies, funders, educational institutions, and government agencies. In the final chapter of their 1995 book titled, *Why the information highway? Lessons from open & distance learning*, Keough and Roberts used case studies to illuminate information and communication technology government policy impacts on open and distance education. Their approach to analyzing federal and provincial policy instruments advocated for policy changes in response to the emerging information and communication technologies in use at the time. This approach can be used to remove policy barriers to future use of technologies not yet developed.

Broad historic similarities exist between the pre-digital age in Canada and the sectors that influence open and distance education. Governments took an interest in developing and regulating federal waterways, highways, and rail systems for economic trade routes and social goals. A similar interest was made in the telecommunication and broadcasting sectors. Spanning decades of changes from interactive telecommunication to the envisioning of high-speed broadband networks, Keough's writings about the open and distance education field documented the history, framed ways to develop policy, and foreshadowed the social impact of unmet challenges. Privatization of information communication technology (ICT) companies meant a weakening of the social policy goals through ICT (Keough & Roberts, 1995, p. 254). In the 1996 master's thesis titled, *Telecommunications Policy Communities and Policy Options for Rural Areas,* Keough predicted what we now call the *digital divide* and wrote that "some approaches to telecommunications diffusion, particularly in an unregulated and competitive environment, create dichotomies between urban and rural areas, large and small businesses, and social and business applications" (Keough, 1996, pp. 7-8). As communication networks become more sophisticated, a problem emerges that echoes *the last mile* problem in tangible-goods transportation infrastructure. Getting broadband connections to rural and remote areas is difficult (Bainbridge & Wark, 2023, p. 246).

CONCLUSION: PUBLISH OR PERISH FROM HISTORY

Matilda Gage, in 1870, contemplated what was lost by women not claiming their scientific inventions as their own. More than a hundred years later, Rossiter lends Gage's first name to this continuing phenomenon by coining the term Matilda Effect in science. Since then, the Matilda Effect has been used to investigate this phenomenon in many fields outside of science. Published literature is one common good that records academic history. This

series of articles has been developed to bolster that published record, so that the accomplishments of pioneer women in open and distance education do not perish from the human historic record. The works of these pioneers matter. Aiming to contribute to countering the Matilda Effect, this article's focus was on the work of the pioneer in open and distance education, Erin M. Keough, whose work supports the compelling sense that distance education can fulfill a social contract to collectively foster the pursuit of knowledge as a common good. Keough's self-reflection on professional accomplishments in open and distance education was to call them, "my bit of something left to the world at large" (Bainbridge & Wark, 2023, p. 255).

What do we know from Keough's work? Distance education matters. Collaboration fuels success. Effort is satisfying. Say "yes" to trying new technologies, and participating in policy development. In Keough's own words, "What is a job without challenge? Just another boring day at the office." (Bainbridge & Wark, 2023, p. 246).

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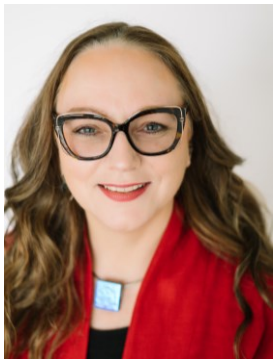
BIODATA and CONTACT of the AUTHORS



Dr. Peggy Lynn MacIsaac is an educator, artist, and librarian. Fostering academic agency in individuals to freely set and pursue their academic goals informs her research and practice. Peggy Lynn is an award-winning scholar earning a Doctor of Education in Distance Education from Athabasca University, a Master of Library and Information Studies from The University of British Columbia, and a Bachelor of Arts in Interdisciplinary Studies from Carleton University. Her subject areas of interest include higher education for refugee-background learners, cross-disciplinary multimodal (including arts-based) research design, the open movement, and social justice.

MacIsaac, Peggy Lynn (Dr.)
Peggy Lynn MacIsaac Consulting
Canada
plm2030@gmail.com
https://peggy-lynn-macisaac.ca/
https://orcid.org/0000-0002-4875-7374

Dr. Susan BAINBRIDGE is an instructor and co-supervisor with the Centre for Distance Education graduate/postgraduate programs at Athabasca University in Canada. She holds a Doctor of Education in Distance Education obtained at Athabasca University in 2013. She earned her MA in applied linguistics at the University of Southern Queensland in Australia, and her BA in religious studies at Laurentian University in Canada. Her research interests include online learning in underdeveloped countries, leadership, online pedagogy and design, as well as gender issues in education.

Bainbridge, Susan (Dr.)
Athabasca University
Address: 1 University Drive, Athabasca, AB Canada T9S 3A3
Phone: 1-800-788-9041 ext. 6179
E-mail: susanbainbridge@athabascau.ca
URL: https://cde.athabascau.ca/ourpeople/instructors/sbainbridge.php
https://orcid.org/0000-0002-7505-6995

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MULTIPLE CONTENT ANALYSIS MODELS FOR ANALYZING HIGHER ORDER THINKING DEVELOPMENT IN ONLINE FORUMS

Hiroshi MIYASHITA
moana38ffy@gmail.com
Tokyo Metropolitan Matsugaya High School, Japan

Norine WARK
norinewark@gmail.com
Education, Technology, & Research Consultant, Canada

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ABSTRACT

Literature on blending multiple coding methods to obtain a more nuanced understanding of the complexities of thinking remains limited. This article explores asynchronous transcripts from an action research study to determine whether or how multiple content analysis instruments can effectively assess the development of higher order thinking. The intervention design was based on ecological constructivism. The mediation provided drew upon sociocultural theory. The study included 16 Japanese high school students engaged in English-based online synchronous and asynchronous activities, supported by in-person, face-to-face sessions conducted in Japanese. Qualitative data were collected from asynchronous forums, a post-survey, and my observation notes. Participants' forum interactions were transformed into quantitative data using three content analysis instruments: the Interaction Analysis Model (IAM), the Cognitive Dimension of Revised Bloom's Taxonomy, and Krathwohl's Affective Domain. These were selected based on the definition of higher order thinking adopted in this study. It was concluded that it takes time to analyze data with multiple models. Researchers need to be trained to use each model properly. Nevertheless, this study indicated that the use of multiple content analysis models can facilitate the development of higher order thinking in online discussion forums by complementing each other and highlighting different aspects of thinking.

Keywords: Content analysis models, Interaction Analysis Model, Cognitive Dimension of Revised Bloom's Taxonomy, Krathwohl's Affective Domain, higher order thinking, online forums, action research

INTRODUCTION

Education is taxed to transform itself in response to various demographic, technological, economic, and sociocultural changes moving into the fourth industrial revolution (Ally & Wark, 2020; Keller, 2008). Therefore, a critical responsibility for educational institutions is to provide learning environments that foster the development of independent learners who possess such skills as critical thinking, problem-solving, and learning how to learn in order to function in this complex world (Ally & Wark, 2020; Collins, 2014; Gabriel, 2007; Glassman et al., 2022; Wark, 2018; World Economic Forum, 2023).

In the wake of the COVID-19 pandemic, some online learning programs still appear to replicate traditional self-study correspondence courses or traditional in-person face-to-face (F2F) classes following lecture-based formats (Hodges et al., 2020) and a knowledge transmission model. In contrast, the mainstream online learning model emerging in recent

decades is characterized by technology-mediated knowledge construction through interaction in collaborative learning communities (Garrison, 2016). Although synchronous interaction is recognized as being beneficial in online learning programs, the asynchronous forum remains a hallmark of quality online learning due to the power that reflection and writing have for fostering learners' higher order thinking (Conrad & Openo, 2018). For the purpose of this study, *higher order thinking* is defined as "cognitive mental functions of understanding, applying, analyzing, evaluating, and creating knowledge, which are voluntarily controlled and facilitated through interaction" (Miyashita, 2022, p. 7).

An effective method for asynchronous communication analysis widely employed in online learning is content analysis (De Wever et al., 2006). Data from participant interactions in asynchronous forums is captured, stored, and then analyzed to discover patterns of knowledge construction. Transcriptions of online discussions can serve as a rich data source for informative, actionable feedback to students, teachers, and researchers (Bienkowski et al., 2012). Historically, content analysis focused upon gathering quantitative data on levels of participation. Then it was adopted as a tool for understanding transcripts on a deeper level (De Wever et al., 2006). Generally-speaking, the goal of content analysis is to expose information that is not readily observable at a surface level in transcription. A popular method of content analysis is coding. *Coding* is the assignment of a categorizing label to each unit of data (Cohen et al., 2018).

The Interaction Analysis Model (IAM; Gunawardena et al., 1997) is an established model (defined as a categorical system readily applied in practice; Miyashita & Wark, 2024) for exploring the social construction of knowledge in forums (Hall, 2014; Lucas et al., 2014). Although the IAM identifies three types of interaction (i.e., learner-content, learner-instructor, and learner-learner), which facilitate deeper thinking in collaborative constructivist learning environments (Moore, 1989), IAM does not assess learner-content interaction (i.e., interaction with learning materials provided in the program, such as books or video clips). Nor is the IAM able to assess students' learning or their reflections on an individual level, even though reflection is believed to be a critical aspect of collaborative constructivist learning (Conrad & Openo, 2018; Garrison, 2016; Liu et al., 2023; Rose, 2013). Furthermore, the IAM does not capture the complexity of thinking, including higher order thinking. Therefore, researchers are encouraged to complement the IAM with other forms of analyses to provide a more holistic picture of learning when assessing forums.

In fact, the IAM has already been used with other kinds of analysis procedures in some research studies. To illustrate, IAM has been triangulated with quantitative data on degrees of participation, qualitative data gathered from interviews or questionnaires, and with graphs or maps to visualize forum contributions (Hall, 2014; Lucas et al., 2014). The IAM has also been merged with other content analysis models, such as Newman et al.'s (1997) in Marra et al.'s (2004) work, Salmon's (2000) and Tuckman's (1965) in Brace-Govan's (2003) study, and Veerman and Veldhuis-Diermanse's (2001) in Schellens and Valcke's (2005) research. Still, content analysis tends to adopt the IAM as the sole model.

Content analysis is not a universally-applicable method; moreover, the concept of thinking is exceedingly complex. Thus, researchers are encouraged to identify content analysis models that suit the purpose of their study (Braun & Clarke, 2021; St. Pierre & Jackson, 2014). A review of literature indicates that, while there is a wealth of resources on how to better merge coding with other qualitative methods (Cohen et al., 2018), literature on how to blend multiple coding methods to obtain a more nuanced understanding of the complexities of thinking remains limited. To address this gap, this article explores asynchronous transcripts from an action research study to discover whether or how the use of multiple content analysis instruments can effectively access the development of higher order thinking. The research questions guiding this exploration are: (1) What are the

advantages and disadvantages in using multiple content analysis models to understand participants' thinking, if any? and (2) How can effective combinations of multiple content analysis models be determined?

METHOD

Action research

This study employed an action research methodology. Generally-speaking action research is "a small-scale intervention in the functioning of the 'real' world and a systematic, close examination, monitoring and review of the effects of such an intervention, combining action and reflection to improve practice" (Cohen et al., 2018, p. 441). There are two action research camps: the critical theorists' and the reflective practitioners' (Kemmis, 1997). The former considers action research within a larger agenda that is focused upon transforming education and society, whereas the latter engages action research to enhance professional practice at a local level. This study merges philosophies from both camps. Although generalizability of conclusions from this study is limited by the small number of participants learning within a specific context, detailed description of the course design, research site, and procedures enable transference to other settings.

Participants

This intervention was implemented in July-August, 2021, where I was employed at a public high school in Tokyo, Japan.

Enrolled in the second year (Grade 11 in the K-12 system) at this high school, all respondents voluntarily participated in the blended learning (BL) program that I designed. The number of potential participants was limited to 20; 18 were accepted. Data were excluded for two participants, as they only attended the synchronous portion of the program. Thus, the results reported herein were collected from the remaining 16 participants, who attended the synchronous and asynchronous portions of the program.

Researchers' roles

At the time of the BL program intervention, I was a full-time EFL instructor at the study site. I worked as the researcher, program designer, and primary asynchronous instructor in the BL program during the study. Due to the multiplicity of my responsibilities during the design and implementation phases, I felt it was crucial to carefully consider stakeholders' feedback. I also focused on developing my skills as a self-critical practitioner during each step of the cyclical process of this action research study (McNiff, 2013). An adjunct professor, engaged by universities in U.S.A., was invited to join me as the primary synchronous session instructor.

Design of the intervention

The BL program was a supplementary course, which students voluntarily completed. Employing the use of English for instruction and communication, participants engaged in synchronous and asynchronous constructivist learning activities in this program. The program consisted of three online asynchronous forums (one practice and two main forums; each one running for five consecutive days), combined with two 90-minute synchronous sessions. Activities were reinforced with in-person F2F sessions, employing direct instruction in Japanese about program contents, procedures, activities, and technologies. Although the in-person F2F component was designed to include 90-minute meetings at the beginning, middle, and end of the program, only the initial meeting occurred. The optional second session was not attended, and the final session was cancelled due to the COVID-19 pandemic. An explicit reflection period concluded the

program. Figure 1 depicts the flow of this BL program.

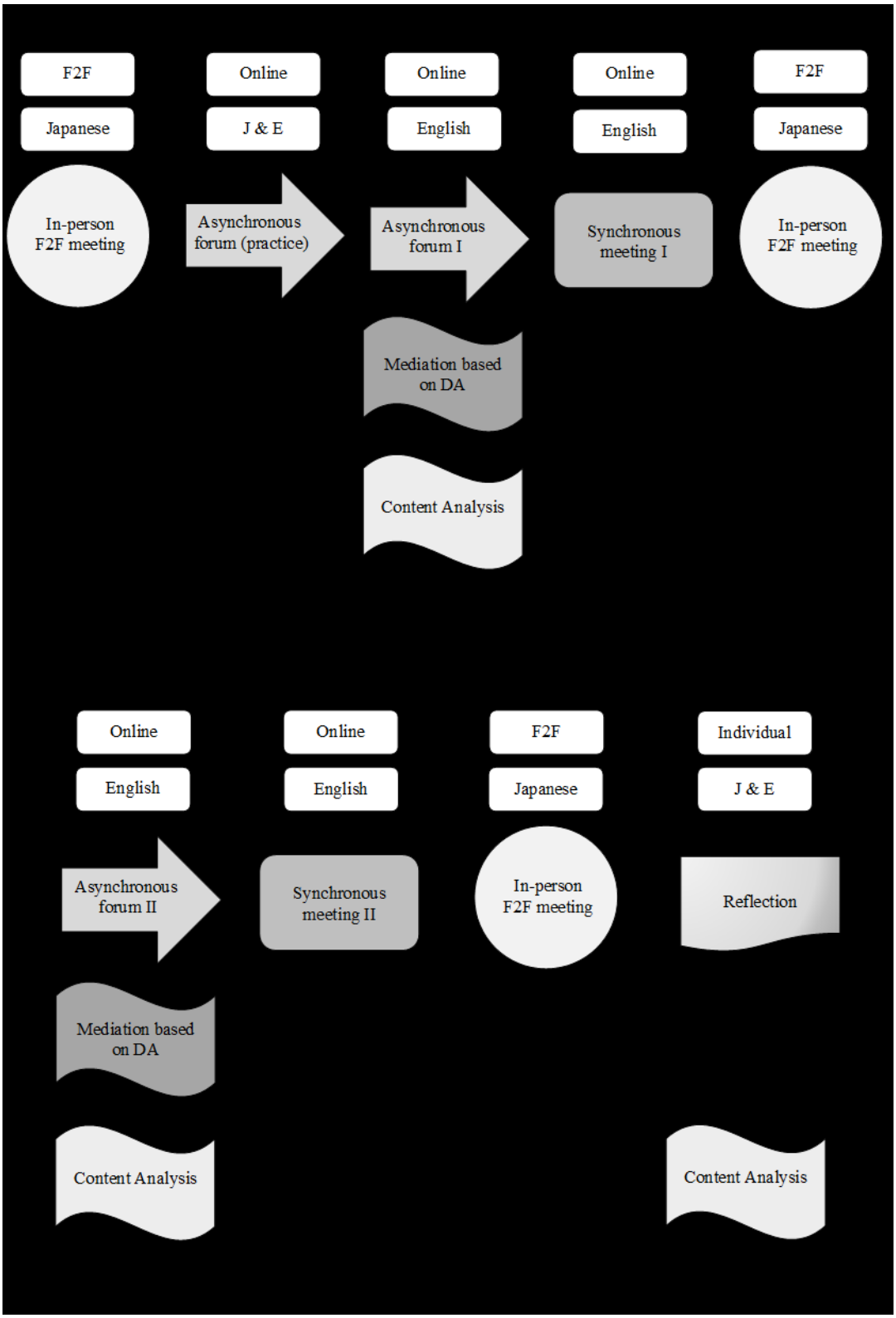

Figure 1. The flow of the blended learning program.

Theoretical foundation

The theoretical framework underlying the design of the BL program was constructivism. From within this broad framework, I drew upon the theory of social constructivism for student interactions, and ecological constructivism (Hoven & Palalas, 2016) for the connection between individual and collaborative learning, as well as for student reflections.

Instructional meditation in the asynchronous forums incorporated sociocultural theory (Lantolf et al., 2015) and dynamic assessment (Lantolf & Poehner, 2011) to promote greater systematic and learner-attuned mediation, and to enrich participants' higher order thinking (Lantolf & Poehner, 2004).

Instructional design

I wanted to move beyond teacher-led acquisition-oriented learning to adopt a more heutagogical (learner-determined) approach (Hase & Kenyon, 2013; Oktay & Yüzer, 2023), so I selected learner-centered inquiry-based instruction as the main instructional method for the BL program (Laurillard, 2012; Reigeluth & Carr-Chellman, 2009). As the primary instructor, I chose the theme and guiding questions. Participants explored the theme and related topics primarily through online discussion forums and reflection activities. As defined by Teaching English to Speakers of Other Languages (TESOL), the teaching method also included cooperative language learning and content-based instruction (Richards & Rodgers, 2001).

Course topic

Due to the current socio-political climate in Japan, students typically accept that English is essential for their future economic success. The course topic was purposefully constructed to encourage students to expand their metacognitive perspective on the value of English language learning. For instance, during the second synchronous session, participants designed individual presentations to address this question, "How can learning English be meaningful to me and to the world?" Two preceding asynchronous forums encouraged students to develop deeper thoughts on this question.

Data collection

The three data collection instruments included online discussion forums, a post-survey, and researcher observations. Artefact, inquiry, and observational data (Hendricks, 2013) were gathered. Artefacts consisted of asynchronous posting records from participants' interactions and contributions. Two initial asynchronous forums promoted student self-introductions and practice on the Google Classroom forum platform. I began interacting with students as the primary instructor/facilitator when they joined the two five-day forums (Forum 3 and 4). I did not mediate Forum 5, as it was intended for students to post individual, non-interactive reflections on the BL program. All participant forum posts were in English. Participants were invited to use English or Japanese to answer open-ended questions on their reflections about the program; all participants chose to respond in Japanese on the post-survey. I translated their responses into English for coding purposes. Final data were obtained from field notes that I recorded throughout the study process.

Data analysis and interpretation

I employed three data analysis procedures. First, I used content analysis (coding) to generate quantitative data. Second, I selected qualitative interpretive analysis to explore transcript, observational, and post-survey data. Finally, I triangulated the coded

quantitative data with the qualitative data, drawn from the qualitative interpretive analysis process, to yield a more comprehensive interpretation of the phenomena. Thus, this study exemplified a convergent parallel mixed methods design (Creswell, 2014).

Participants' asynchronous forum postings were transformed into quantitative data by employing the IAM (Gunawardena et al., 1997), Cognitive Dimension of Revised Bloom's Taxonomy (Cognitive Dimension; Anderson et al., 2001), and Krathwohl's Affective Domain (Affective Domain; Krathwohl et al., 1964).

The IAM consists of five phases with a number of sub-categories. The initial phase begins with lower mental functions, while subsequent phases progress towards increasingly higher mental functions, based upon Vygotsky's terms. Ordered from the initial to final phases, these phases are: (I) sharing/comparing of information, (II) discovery and exploration of dissonance or inconsistency among ideas, concepts, or statements, (III) Negotiation of meaning/co-construction of knowledge, (IV) Testing and modification of proposed synthesis or co-construction, and (V) Agreement statements(s)/application of newly-constructed meaning (Gunawardena et al., 1997). The six major categories in the taxonomically-arranged Cognitive Dimension are: (1) Remember, (2) Understand, (3) Apply, (4) Analyze, (5) Evaluate, and (6) Create. These categories are ordered from simple/concrete to complex/abstract (Krathwohl, 2002). The Affective Domain is also organized as a hierarchical structure from simple to complex notions: (1) Receiving, (2) Responding, (3) Valuing, (4) Organizing, and (5) Characterizing. While the Affective Domain may not be synonymous with higher order thinking, it is bonded to the concept since the first two, Receiving and Responding, are linked to community building/social construction of knowledge, and the latter three, Valuing, Organizing, and Characterizing, are linked to higher cognitive functions/metacognition. The connection between the Cognitive Dimension, Affective Domain, and IAM are further explored in the Discussion section.

When coding qualitative data, it is prudent to select a unit of analysis that fits the purpose of a study (Rourke et al., 2001). Instructions included with the IAM instrument suggested that the unit of analysis should be the message, as the message represented the participant's understanding and offerings to collective knowledge construction in a forum (Gunawardena et al., 1997). The typical message and therefore, IAM coding unit, in this study consisted of one participant's post contributed to the forum at a specific moment during a given discussion. Cognitive Dimension and Affective Domain data were also coded using the message for the unit of analysis. Most often, a message was coded only once; however, occasionally a message was assigned to two or more codes. I employed a second coder to ensure a high level of coding reliability. Inter- and intra-coding reliability were not established as we coded all of the data together (Cohen et al., 2018).

Ethical requirements

In keeping with ethical standards (Cohen et al., 2018), I secured written permission from the study site's school principal prior to distributing a Letter of Information and Consent form to potential respondents (16- to 17-year-olds) and their parents/guardians. I discussed the aims, benefits, and risks of the program before students signed the form, ensuring that they understood their participation was voluntary and that they could leave the study at any time without risk of penalty.

RESULTS

Levels of participation: Quantitative data

On average, participants posted 2.3 messages in Forum 3 and 1.6 in Forum 4. These messages yielded an average of 121.8 words per post in Forum 3 and 121.4 words in Forum 4. Seven participants (43.8% of all participants) contributed posts in Forum 5 (the non-interactive reflective forum). Lastly, 12 participants (75.0%) finished the post-survey. As the primary instructor, I added a total number of 22 posts to Forum 3 and 24 to Forum 4, generating an average of 169.9 words per post in Forum 3 and 173.3 in Forum 4.

Participants' directional data (responses to prompts, other participants, or instructors) were also analyzed. Results indicated that 13 posts in Forum 3 (35.1% of all Forum 3 posts) and 14 posts in Forum 4 (56.0% of all Forum 4 posts) were generated from prompts. Coupled with the low number of participant posts in these forums, these results indicate that learner-learner and learner-instructor interaction was limited. Bullen (1997) identified two groups of forum messages: independent (responding to a discussion topic, without reference to other messages), and interactive (referencing other messages to advance a discussion). Applying Bullen's groupings indicates that most participants offered independent messages in response to prompts (n=13 in Forum 3; n=14 in Forum 4), while only seven messages in Forum 3 and four messages in Forum 4 were interactive in nature.

Forum 3: First main forum

Given the significant volume of data collected, only key results are reported here. Other results are available on request. Statistical data expressed in percent are rounded to the nearest tenth of a percent.

The IAM consisted of five parent codes, each represented one of the following phases: I: Share-Compare; II: Dissonate; III: Negotiate-Construct; IV: Test Construct; and V: New Knowledge. The Cognitive Dimension yielded six parent codes: (A) Remember, (B) Understand, (C) Apply, (D) Analyze, (E) Evaluate, and (F) Create. Lastly, the Affective Domain had five parent codes: (A) Receiving, (B) Responding, (C) Valuing, (D) Organizing, and (E) Characterizing.

In Forum 3, participants posted a total of 79 messages; eight messages were coded twice, and one was uncoded (it was a grammatical notation from the participant's previous post). Therefore, a total of 86 IAM units were coded from this forum. Seventy-two units (83.7% of all units coded to IAM) were coded to Phase I, two units (2.3%) to Phase II, 11 (12.8%) to Phase III, and one (1.2%) to Phase IV.

None of the the 79 Cognitive Dimension messages contributed by participants in Forum 3 were double-coded, while one was uncoded, producing a total of 78 units. Forty-seven (60.3% of all Cognitive Dimension units) were coded to (B) Understand, nine (11.5%) to (D) Analyze, and 22 (28.2%) to (E) Evaluate.

The Affective Domain produced a total of 78 units; 58 (74.4% of all Affective Domain units) belonged to (B) Responding, and 20 (25.6%) to (C) Valuing. Figure 2 illustrates the number of units by parent code for each instrument.

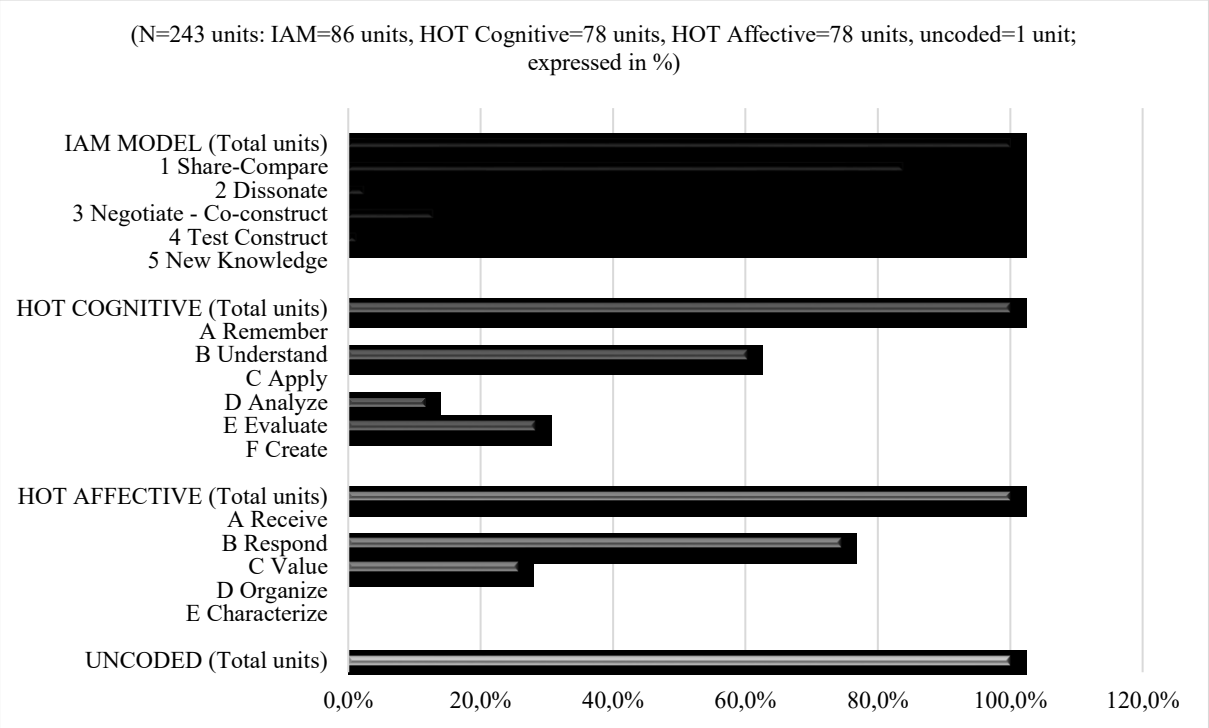

Figure 2. The proportion of coded units in forum 3: participants.

Forum 4: Second main forum

Forum 4 produced a total of 29 participant messages, generating a total of 29 units each for the IAM, Cognitive Dimension, and Affective Domain parent codes. Of these, 22 IAM units (or 75.9% of all IAM units) were sorted into Phase I: Share-Compare, six (20.7%) to Phase III: Negotiate-Construct, and one (3.4%) to Phase V: New Knowledge.

Thirteen of the 29 Cognitive Dimension units (or 44.8% of all Cognitive Dimension units) were allocated to (B) Understand, 10 (34.5%) to (D) Analyze, and six (20.7%) to (E) Evaluate.

Of the 29 Affective Domain units, 15 (or 51.7% of all Affective Domain units) were assigned to (B) Responding. The remaining 14 (48.3%) were assigned to (C) Valuing. Figure 3 graphically represents the proportion of coded units from participants' messages allocated to each instrument's parent code.

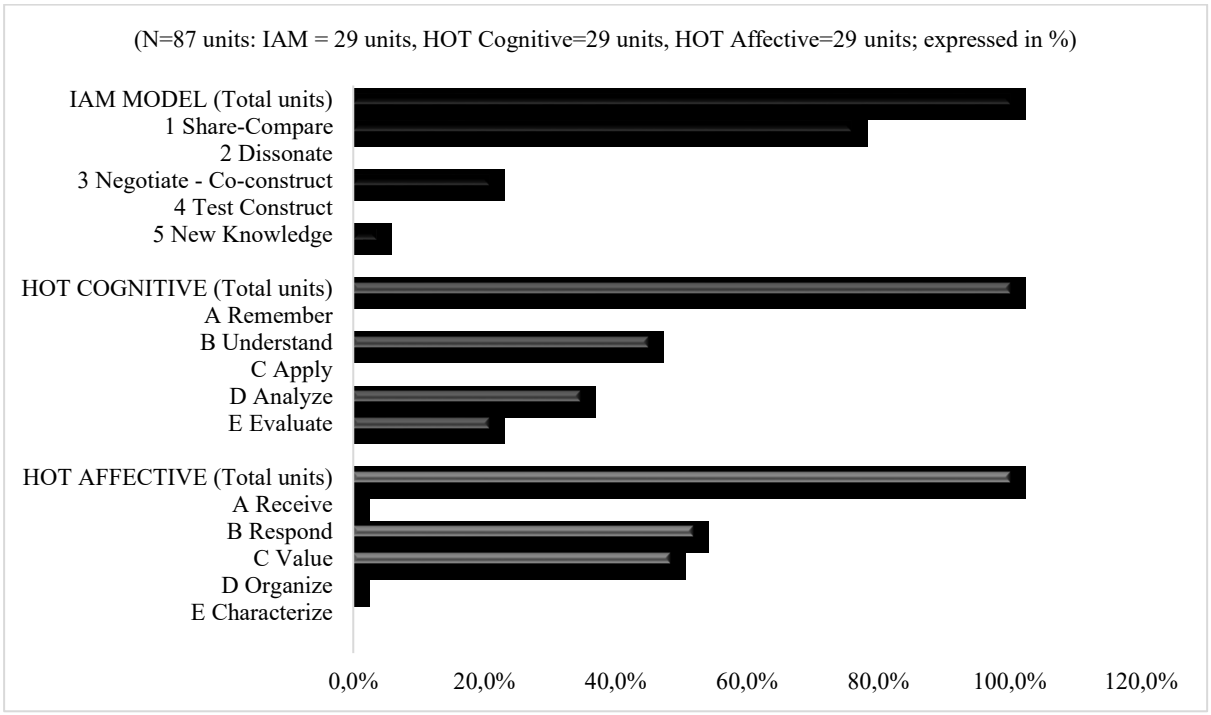

Figure 3. The proportion of coded units in forum 4: participants.

Forum 5: Reflection forum

Since Forum 5 asked participants to post their reflections on the course, rather than interact with each other or the instructor, the IAM instrument was not applied to this part of the analysis process. In total, seven units were allocated to each of the Cognitive Dimension and Affective Domain frameworks. Of the seven Cognitive Dimension units, one (or 14.3% of all Cognitive Dimension units) was allocated to (D) Analyze and six (85.7%) were allocated to (E) Evaluate. Of the seven Affective Domain units, five (or 71.4% of all Affective Domain) were assigned to (C) Value and two (28.6%) were assigned to (D) Organize. Figure 4 graphically represents the percentage of units assigned to the Cognitive Dimension and Affective Domain parent codes.

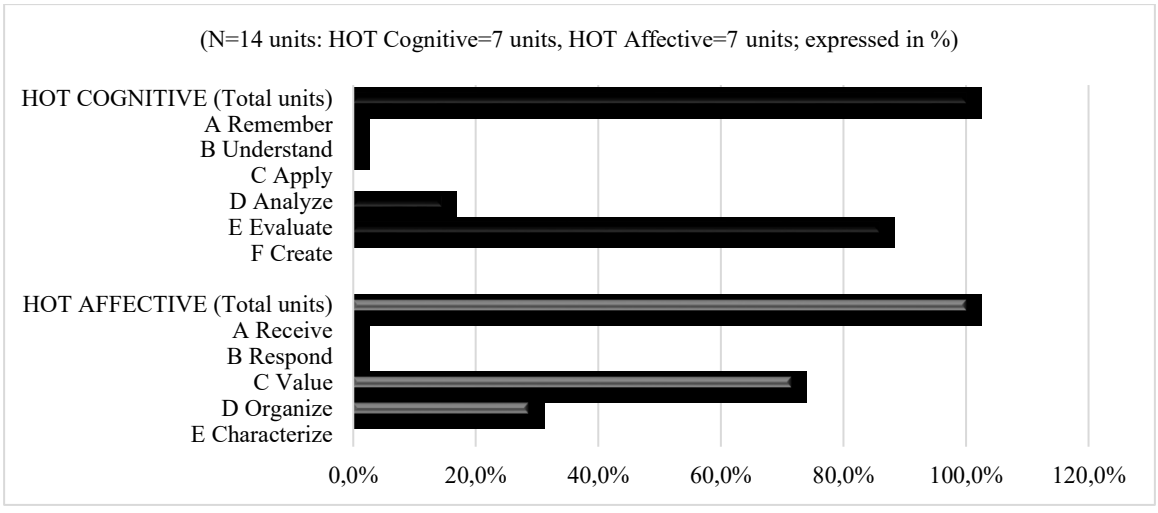

Figure 4. The proportion of coded units in forum 5: participants.

Inconsistencies between the IAM and the other two models

Phases I and II of the IAM are thought to be lower-level, while III to V are thought to be higher-level social construction of knowledge categories (Gunawardena et al., 1997). Likewise, categories A and B are thought to be lower, while C and above are higher levels of thinking in the Cognitive Dimension and Affective Domain (Tanujaya et al., 2017). Figure 5 illustrates how many units (or messages) from the lower and higher categories in the IAM in Forum 3 belonged to lower or higher categories in the Cognitive Dimension and Affective Domain respectively. Likewise, Figure 6 shows how many units that were sorted into lower and higher categories in the IAM in Forum 4 belonged to lower or higher categories in the Cognitive Dimension and Affective Domain.

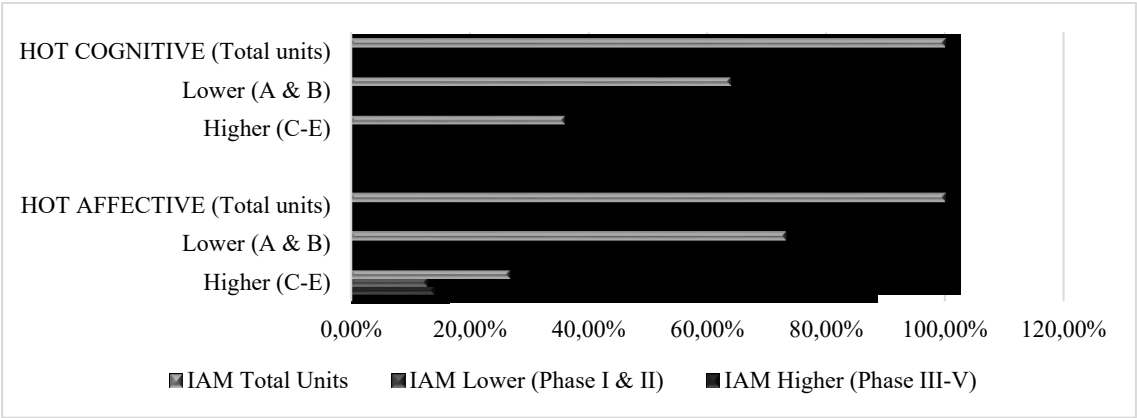

Figure 5. Forum 3 lower and higher order thinking: IAM vs Cognitive Dimension and Affective Domain.

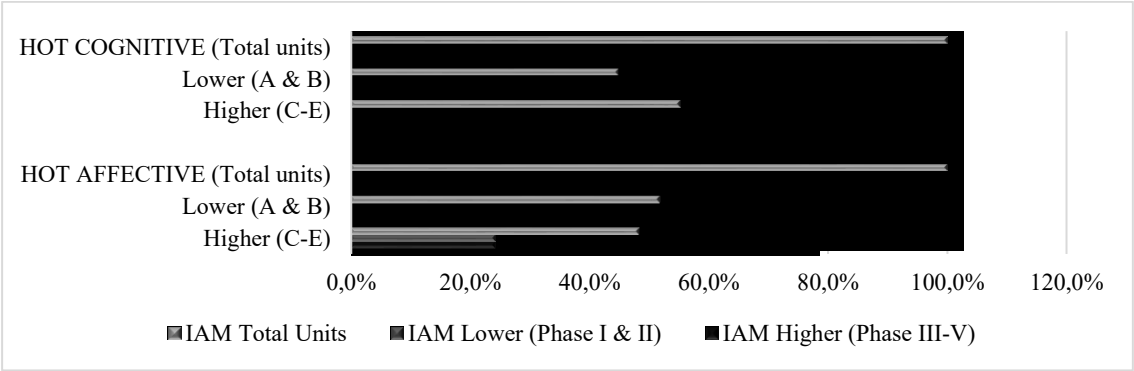

Figure 6. Forum 4 lower and higher order thinking: IAM vs Cognitive Dimension and Affective Domain.

Figure 7 compares the number of lower and higher level IAM units to the number of lower and higher level HOT (combined Cognitive Dimension and Affective Domain) units for Forum 3 and Forum 4. The IAM was not used in Forum 5 since participants were not asked to interact in this forum.

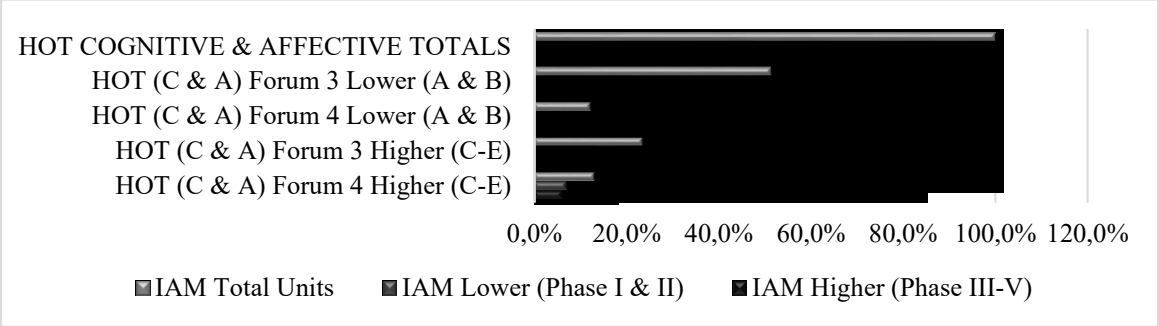

Figure 7. Forum 3 vs forum 4 lower and higher order thinking: IAM vs HOT (Cognitive Dimension and Affective Domain).

DISCUSSION

The most significant finding generated from the coding results indicated that learner-learner interaction in Forum 3 and 4 was minimal; nonetheless, participants demonstrated the development of higher order thinking through their engagement in this program. To illustrate, more messages in Forum 4 were coded into higher order thinking categories than in Forum 3 (Figure 7), suggesting that higher order thinking developed over time. Even though only seven participants contributed to Forum 5 (the individual-based reflection forum), all messages in this forum were coded to higher categories in the Cognitive Dimension and Affective Domain. Two participants stood out; they generated the most higher order thinking units coded to all analysis models in the three forums. These students actively interacted with other participants and the instructors, employing various facilitation strategies.

The following sections address the two research questions posed in this study, using coding results, a closer examination of participants' messages, the post-survey, and my observational journal juxtaposed with relevant literature.

Advantages of multiple content analysis models

The first research question was: What can be the advantages and disadvantages in using multiple content analysis instruments to understand participants' thinking, if any? Figures 5 and 6 in the Results section illustrated that messages sorted into higher categories in the IAM also belonged to higher categories in Cognitive Dimension and Affective Domain. In contrast, messages sorted into lower categories in the IAM might belong not only to lower but also higher categories in Cognitive Dimension and Affective Domain (Figure 7). The following three subsections explore why these inconsistencies may occur.

Sharing opinions with higher cognitive or affective functions

According to the IAM (Gunawardena et al., 1997), if a message is a statement of observation or opinion, the message has to stay in Phase I: sharing/comparing of information. In Forum 3 and 4, participants were required to answer two or three guiding questions in their first contribution to the forums after they read given articles and watching given video clips. Thus, all of the messages that responded to the guiding questions had to be sorted into Phase I in the IAM, because they were opinion statements. For example, in Forum 3, participants were asked if they agreed with the author after reading a short article that stated English was a global language. The following examples illustrate responding messages from Forum 3. (The coding results are inserted in square brackets after each unit of analysis.)

Phase I in the IAM and Lower Cognitive/Affective Categories

Example (a): I agree with this article. I think English will become more and more important by the time I work. [(B) Responding in Affective Domain; (B) Understand in Cognitive Dimension; Phase I in IAM]

Phase I in the IAM and Higher Categories in Cognitive/Affective

Example (b): I agree with this article. I feel more people need to learn English when I hear about my mother's and father's works. My father's company and American company will merge so he practice[s] speaking English online. My mother works in a nursery school, and takes care of some children whose mother or father is from other country. To make signs to them, she is trying to learn necessary sentence. But in my own case, these things cannot lead my motivation to study English hard because I am still a student so I cannot feel real sense of the necessity to lean English. [(C) Valuing in Affective Domain; (E) Evaluate in Cognitive Dimension; Phase I in IAM]

Example (c): Since people all over the world speak English as their first or second language, it can definitely be said that English is a global language, which is used in almost every field. Some people might say that English is just a language and people won't need it anymore because of the development of AI. However, I strongly agree with the author. Firstly, when I was studying in Australia, I noticed that the amount of information that came up when searching in English was much greater than when searching in Japanese. This means people use English to write articles with the aim of informing a wider audience. Secondly, I think you would probably talk to people in English when you go to a non-English-speaking country such as Russia, even though the Russian language is the fifth most spoken language in the world. That's probably because you would assume that they speak English to some extent. For these reasons, I believe that no one will deny it when they are told that English is the international language, which is used in countless spheres, education, business and science as such. [(C) Valuing in Affective Domain; (E) Evaluate in Cognitive Dimension; Phase I in IAM]

Example (a) was a reply to the guiding question with no affective commitment or higher cognitive functions. In contrast, Example (b) was also a reply to the guiding question, but this participant evaluated the importance of English as a global language by comparing the situation of her parents with her current feelings, showing some commitment to this issue. In Example (c), this participant also evaluated the importance of English as a global language by bringing in, and disagreeing, with the idea that people will not need to learn English with the development of artificial intelligence (AI).

Many of the forum 3 messages represented simple responses to the questions, which were readily sorted into lower categories in Cognitive Dimension and Affective Domain, yet some included higher cognitive or affective functions. Thus, even if participants do not interact with instructors or other participants, they can demonstrate higher order thinking in forums, which cannot be assessed by the IAM.

Negotiating, but with materials.

In the IAM, if a message demonstrates negotiation or co-construction of knowledge, the message can belong to a higher category, Phase III: Negotiation of meaning/co-construction of knowledge. However, the IAM was developed only for assessing collaborative co-construction of knowledge among participants and instructors; thus, this model cannot assess participants' interaction with content (i.e., learning materials, such as articles or video clips) provided in forums. One of the major advantages of adopting online

learning is its potential to increase interaction, which is divided into three categories: learner-content, learner-instructor, and learner-learner (Moore, 1989). It is common for participants to be given learning materials in forums; thus, this can be a drawback of the IAM if the purpose is to assess the development of thinking in forums.

In Forum 4, participants were required to answer whether they agreed with the author after reading a short article that described advantages and disadvantages of English as a global language, and by watching two video clips related to the theme of this article. Consider the following sample responses.

> **Phase I in IAM and Lower Cognitive/Affective Categories**
> **Example (d): I agree with the author because we should communicate with people from different countries and know more about each other in the present day. Today we live in the globalization age. We learn a lot of things to make the world better than it is now. To communicate with many people, we can get a chance to discover a different viewpoint from us. I think that learning English makes us happy. Not only students but also adults should enjoy learning English and using English in various situations. When we will be adults in the future, I think it will be common to live with English as well as Japanese. [(B) Responding in Affective Domain; (B) Understand in Cognitive Dimension; Phase I in IAM]**
>
> **Phase I in IAM and Higher Cognitive/Affective Categories**
> **Example (e): In my opinion, I do agree with most of the pros and cons described in those two videos. However, I don't 100% agree with one of the cons. Many people spend hours, days, or even years pronouncing words and sentences trying to sound like "native speakers" which I think is useless since as Jay Walker said, English is a global language and is not a language that belongs to a particular region or country. Of course, speaking audible English is essential for making communications with others using that language. However, there is no such a thing as "Perfect English" and speaking in pronunciation which they fit into will, in my opinion, reflects their linguistic culture. As we are living in a diverse society, these differences in pronunciations should be respected and people should not be forced to "fix" their pronunciations to speak like the native speakers (people who speak English as their first language which in this situation, referring to the British or Americans). From what I mentioned above, the pronunciation of English is not a con that should be fixed but a pro that should be respected since it reflects our diverse society. [(C) Valuing in Affective Domain; (D) Analyze in Cognitive Dimension; Phase I in IAM]**

Example (d) illustrates a respondent's generalization about the article being read. In contrast, the respondent in Example (e) negotiated with contents provided, arguing that there is no perfect English and diversity in English pronunciation should be respected. While many of forum 4 messages represented simple responses to the questions, which were readily sorted into lower categories in Cognitive Dimension and Affective Domain, some included higher cognitive or affective functions, negotiating with reading materials and/or video clips. This leads to the conclusion that, even if participants do not interact with instructors or other participants, they can develop higher order thinking by interacting with content provided in forums, which cannot be assessed by the IAM.

Negotiating, but within themselves (reflection/metacognition)

The IAM is also unable to assess learner interaction within themselves. The definition of *reflection*, an element of learning internal to individual learners, is not fixed, but inner interaction can be recognized as a form of reflection. Reflection is an important practice that can be incorporated in online discussion forums because asynchronous interaction

provides learners with the time necessary to critically reflect on views and to develop higher order thinking (Garrison & Anderson, 2003).

Metacognition is another important concept in higher order thinking. In the IAM, if a statement represents metacognition, the message can be sorted into the highest category, Phase V: Agreement statements(s)/application of newly-constructed meaning; however, metacognition that is recognized as Phase V in the IAM is limited to "Metacognitive statements by the participants illustrating their understanding that their knowledge or ways of thinking (cognitive schema) have changed as a result of the conference interaction" (Gunawardena et al., 1997, p. 14). Metacognition around a learner's self-motivation to learn, for example, cannot be counted as metacognition in the IAM. Considering the importance of reflection and metacognition in the facilitation of thinking, the lack of the ability to assess these two concepts can be a drawback of the IAM if the purpose of the analysis is to assess the development of thinking.

In Forum 3, participants were required to answer this question: Why do you study English? This question was designed to guide participants to deeper reflection, with the support of provided learning materials. While many messages represented simple responses to the question, which were sorted into lower Cognitive Dimension and Affective Domain categories, some included deep reflection or metacognition. The following are examples of both types of messages.

Phase I in the IAM and Lower Categories in Cognitive/Affective

Example (f): I have not decided what I do in the future. So why I learn English is unclear. But there is only one thing I can say. The reason why I learn English now is that it's cool if I can use English fluently. I want to get high scores in the English test such like regular school tests, Eiken, TOEIC, and so on. And I want to speak to foreigners with using English fluently when I go to travel abroad with my family or my friends. [(B) Responding in Affective Domain; (B) Understand in Cognitive Dimension; Phase I in IAM]

Example (g): I have two reasons why I learn English. First, I want to become friends with more people. If I can speak English, I will be able to travel in many countries and meet many people, join volunteer in other country, and help a person who comes to Japan from other country. It is happy to be able to communicate without translation because I can tell what I really want to say accurately. Second, I want to sing the songs in English. My favorite songs are "You Rise Me Up", "This Is Me", "Top Of the World" and so on. If you know [a] good one, please tell me. [(B) Responding in Affective Domain; (B) Understand in Cognitive Dimension; Phase I in IAM]

Phase I in the IAM and Higher Categories in Cognitive/Affective

Example (h): I've been using English for many years since I was a child. At first, I was just finding it interesting to communicate with people in English, but actually, the reason for studying English changed when I started to think about my future career. [(C) Valuing in Affective Domain; (D) Analyze in Cognitive Dimension; Phase I in IAM]

Example (i): I'm going to get in university in Australia to study business and accounting further to work in a global environment, so just being able to understand English doesn't mean anything, but I have to be able to MANIPULATE the language. I try to USE English all the time by speaking and writing. I believe that it's crucial for people who learn English not to be satisfied with just being able to understand it, because it will become the language that everyone should be able to use in the

> **future. [(C) Valuing in Affective Domain; (D) Analyze in Cognitive Dimension; Phase I in IAM]**

The reasons expressed in Examples (f) and (g) were likely honest ones, but it was difficult to recognize elements of higher cognitive functions or respondents' commitment to this issue in these messages. In contrast, the participant who produced Example (h) exercised metacognition; observing the shift of his own motivation to learn English objectively. Also, in Example (i), the participant insisted that his own attitude toward learning English was different from many others' attitudes, thus exercising metacognition and reflection in his response.

The post-survey, closer examination of participants' transcripts, and my observations also suggested that messages sorted into lower categories in the IAM can belong to higher categories in Cognitive Dimension and Affective Domain. For example, one respondent made only one post in Forum 3, which consisted of three messages. Two of the three messages were sortied into lower categories in every model, but one of them was sorted into Phase I in the IAM, (C) Valuing in Affective Domain, and (E) Evaluate in Cognitive Dimension:

> **Example (j): I have two main motives to study English. First, I would like to find some interesting things of overseas for instance music, literature, and movies. There are also so many exciting things in Japan, but cultures using English have exciting things more. If I could use English better, I could enjoy there. Second, I'm afraid of that I can't use English. When something horrible happened in Japan, if I couldn't use English, I couldn't escape. This is useless worry, and I hope that. But, I sometimes feel that "It doesn't mean that Japan is perfectly safe." For example, when I saw or heard a news about nuclear powerplants, I feel that a little. If I could speak English, if I could believe that "I can escape anytime," I could live in Japan with more relief, I think. [(C) Valuing in Affective Domain; (E) Evaluate in Cognitive Dimension; Phase I in IAM]**

In the post-survey, this participant stated, "After I made a post, the instructor sent me an article that was related to what I said in my post. By reading the article, I was pushed to think the matter more deeply. It was an interesting experience," and that "It was interesting to think why we learn English, using English. It was a good topic because I was very motivated to learn English." As the instructor, I offered a significant amount of feedback, including the introduction of new knowledge, presentation of different perspectives, and relevant learning resources in Forum 3 and 4. Although this participant was not actively engaged in forum discussions, his reply on the post-survey indicated that he likely exercised higher order thinking and found value in completing this program.

Examples in the above three sections demonstrate that adopting three tested models can increase the validity of content analysis. If only the IAM was employed for the analysis, the coding results would have shown that all of the example messages belonged to the lowest category of the IAM. On the other hand, these examples illustrate that the use of multiple content analysis models succeeded in capturing a more nuanced picture of the participants' higher order thinking development in forums.

Challenges of using multiple content models

There are a number of challenges to overcome when using multiple content analysis models. First, it takes time to analyze data with multiple models. Also, researchers need to be trained to be able to use each model properly.

Secondly, even if multiple content analysis models are adopted and qualitative analysis is combined with coding, there is a limit to measuring or understanding human thinking (St. Pierre & Jackson, 2014); what was captured in this study can only represent a part of the participants' actual thoughts. For example, it is difficult to assess if a participant fully exercised their potential or not in forums.

Moreover, it does not automatically mean that participants exercised their full potential even if many of their posts were coded to higher categories. Or, just because some participants contributed fewer posts, or posts that were sorted into lower categories, does not mean that they exercised their full potential either. For instance, one participant was highly active in discussions, especially in Forum 3. Most of his messages were sorted into higher categories on all analysis models. He expressed great appreciation for the program in Forum 5 and the post-survey. Yet, knowing how motivated to learn he was, and how proficient his English and communication skills were, it could be possible that he did not achieve his full potential in the program.

Conversely, a second participant contributed only six messages in Forum 3 and two in Forum 4; most of these messages were coded into the lower categories on all instruments. Yet, in the post-survey this participant wrote "When I saw a full screen of English, which seemed to be difficult to read, I had to hesitate to start reading," and "Reading opinions and questions from different perspectives than mine helped me think further." Reflecting upon her struggle to read and express her thoughts in English, coupled with minimal experience in publicly expressing her opinions, leads to the conclusion that she may have maximized her potential in this program, which could potentially lead to further breakthroughs.

Selecting appropriate models

The second research question was: How can effective combinations of multiple content analysis models be determined? Although developing new models in innovative research is encouraged, Rourke and Anderson (2004) recommended that researchers interested in content analysis should use suitable, existing models because creating new ones is extremely complicated, and requires exceptional research knowledge and experience. Therefore, one important factor to selecting appropriate content analysis models is the reliability and validity of the model. The three models that were selected in this study were well-tested.

Most importantly, how to select appropriate content analysis models depends on the purpose of the study and its definition of the subject of the analysis. Content analysis in this study was employed to identify the development of higher order thinking. Even though the concept of higher order thinking is popular and highly valued in education, a clear definition has been elusive. In this study, *higher order thinking* was defined as "cognitive mental functions of understanding, applying, analyzing, evaluating, and creating knowledge, which are voluntarily controlled and facilitated through interaction" (Miyashita, 2022, p. 7). This definition is based on the concept of ecological constructivism (Hoven & Palalas, 2016), wherein collaborative and individual learning through personal reflection are organically integrated. In addition, this definition drew on the Cognitive Dimension (Anderson et al., 2001), which is related to the individual's cognitive processes, the Affective Domain (Krathwohl et al., 1964), which is related to community building (receiving and responding) and metacognition (valuing, organizing, and characterizing), and Vygotsky's concept of lower mental functions and higher mental functions (Vygotsky & Rieber, 1997). Thus, the IAM, Cognitive Dimension, and Affective Domain were selected in this study to assess different aspects of higher order thinking as presented respectively in the proffered definition.

If the purpose of the study had been to explore only the social construction of knowledge, a sole model, such as the IAM, may have been enough. However, if the purpose of a study was to understand the development of thinking, and if thinking was defined as something multifaceted, multiple content analysis models may be required to assess multiple aspects of thinking.

Strict definitions of thinking or higher order thinking put aside, consensus should be that thinking can be developed socially and individually. If so, the combination of content analysis models that were used in this study illustrate one way to assess the development of thinking in forums or other learning environments.

CONCLUSION

The results in this study indicate that the use of multiple content analysis models can help to better understand the development of higher order thinking in online discussion forums. The IAM was created to assess social construction of knowledge resulting from interaction among instructors and other participants. This model cannot assess participants' interaction with learning materials or within themselves (i.e., reflection or metacognition). Also, this model does not assess affective or emotional aspects of learning. Cognitive Dimension and Affective Domain taxonomies complement the IAM by identifying aspects of thinking that the IAM was not designed to capture. Ultimately, the use of multiple content analysis models seems to have succeeded in painting a more nuanced picture of the participants' higher order thinking development in forums.

How to select appropriate content analysis models depends on the purpose of the study and how the study defines the subject of the analysis. If the purpose of a study is to understand the development of thinking, and if thinking is defined as something multifaceted, the combination of multiple content analysis models that fit the definition of thinking is encouraged. If thinking is defined as something that can be developed with three aspects—social, cognitive, and emotional presences—the combination of content analysis models that were used in this study can serve as a prototype to assess the development of thinking in online forums or other learning environments.

While advantages of adopting multiple content analysis models to understand the development of higher order thinking were recognized in this study, methodological challenges were also identified. It takes time to analyze data with multiple models, and researchers need to be trained to be able to use each model properly. Even if multiple content analysis models are adopted, and qualitative analysis is combined with coding, there is a limit to assessing the complexities of human thinking. While methods to explore thinking should be further refined, this limitation should be acknowledged in research that explores human thinking.

Developing higher order thinking in collaborative constructivist learning environments can contribute to nurturing active and critical citizens who help to shape tolerant, diverse, and inclusive communities (Campbell & Schwier, 2014). To further refine programs that include online discussion forums, future research may: 1) explore the development of higher order thinking in forums implemented in different contexts with the same IAM/Cognitive Domain/Affective Dimension analyses model that was used in this study, and 2) explore the development of thinking with different combinations of content analysis models, carefully selecting two or more models that fit the purposes of the study.

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BIODATA and CONTACT ADDRESSES of the AUTHORS

Dr. Hiroshi MIYASHITA is a full-time EFL teacher at a public high school in Tokyo. He earned an MA in literature at Chuo University, Japan, an MEd in teaching English as an additional language at the University of Calgary, and an EdD at Athabasca University, Canada. His research interests include online learning, sociocultural theory, and language policy. His research focus is on collaborative constructivist online/blended learning, which he believes has the power to encourage learners become more critical and creative thinkers, and ultimately, to lead us to build a healthier society.

Miyashita, Hiroshi
Tokyo Metropolitan Matsugaya High School, Japan
Phone: 81-90-5301-0315
E-mail: moana38ffy@gmail.com

Dr. Norine WARK is an award-winning scholar, educator, researcher, and writer, currently working as a freelance educational consultant, researcher, writer, grant writer, and editor in the field of distance education. Norine's Doctor of Education in Distance Education (2018) and Master of Education in Distance Education (2005) were obtained from Athabasca University. Her Bachelor of Education (5 yr.; 1997) and teaching certificate (1991) came from Simon Fraser University. Norine's research focuses upon historic and emerging theory and practice in distance learning, as well as the technologies that enable such learning.

Wark, Norine (Dr.)
Address: RR 1, S6, C5, Dawson Creek BC Canada V1G 4E7
Phone: 1-250-843-7310
E-mail: norinewark@gmail.com