様　式　Ｃ－１９、Ｆ－１９－１、Ｚ－１９　（共通）

# 科学研究費助成事業　　研究成果報告書

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研究課題名（和文）Facilitating Scientific Research and Intercultural Exchange through TaLL

研究課題名（英文）Facilitating Scientific Research and Intercultural Exchange through TaLL

研究代表者
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研究成果の概要（和文）：本研究では、若手科学者が言語と文化の交流、研究アイデアの共有、研究プロジェクトのピアレビューを通じて科学的言語能力を向上させることができるタンデム言語学習（TALL）プログラムを発展させた。カリキュラム分析のフレームワークにより、方針、実践、プロセスに取り組んだ。TALLプログラムで、学習者からのフィードバックに基づき、実施、評価、再設計を行ったところ、特に重要であったのは、言語能力、実生活に即した知識の共有、異文化交流、大学の教育理念・方針との関連性の4点である。プログラムの成果は、個人差が大きいが、共同作業の経験よりも、複数の取り組みを行った方がより効果的であることが示唆された。

研究成果の学術的意義や社会的意義
This project describes a collaborative initiative conducted at two national universities in Japan that helped young scientists understand the professional requirements and conventions they would need to perform effectively in research and industry contexts after graduation.

研究成果の概要（英文）：The researchers developed a Tandem Language Learning (TaLL) scheme, which enabled young scientists to improve scientific language skills through language and cultural exchange, sharing research ideas and peer reviewing research projects. A Curriculum Analysis framework addressed policy, practice, and process. The TaLL program was implemented, evaluated, and redesigned based on learner feedback. Four points emphasized were linguistic competence; knowledge-sharing for real-life contexts; intercultural exchange; and connection to the university's educational philosophy and policies. Content analysis of peer-review exchanges highlighted four conventions: (1) Formatting; (2) Mechanics; (3) Content; and (4) Design. The researchers noted that any gains in these areas varied significantly between individuals and may have been more the result of more from multiple efforts over the period rather than from the collaborative experience, per se.

研究分野：Learner Autonomy

キーワード：Collaborative Research　Tandem Language Learning　Social Constructionism　Learner Autonomy　Professional Development　Self-Directed Learning　Teacher Autonomy　Curriculum Analysis

様　式　C－１９、F－１９－１、Z－１９（共通）

## 1．研究開始当初の背景

The constant change in technologies and organizations today require L2 instructors to adapt quickly to new situations as they try to prepare students for this changing world. A Tandem Language Learning (TaLL) scheme was proposed to help meet the professional needs of young scientists. TaLL is a cross-cultural and cross-generational reciprocal language exchange between speakers who want to learn more about each other's language, interests, field of study and/or culture. As Japanese tertiary institutions continue to experience an increase in the numbers of foreign students, researchers, and company employees, learning how to interact in a globalized Japan require that students receive training in meaningful interaction outside of the classroom. Research shows that collaborative learning and research are becoming increasingly popular as the need to be a part of the global world increases (Braga, 2007; Sasaki, 2014; Hafernick et al., 1997). As the 21st Century progresses and internationalization of higher education gains momentum, encouraging students' intercultural communication is of paramount importance. The benefits of TaLL schemes have been documented in its ability to increase learner autonomy and language awareness (Little, 2003) as well as metalinguistic awareness and cultural exchange (Calvert, 1999). Due to the wide availability of the Internet and rapid advances in technology, it has become easier to implement TaLL programs that allow learners to engage in more meaningful dialogue. For young researchers, meaningful interaction is crucial for successful language learning and improvement in research performances. To experience meaningful interaction, it is important to communicate with real-life goals in mind (McCarthy, 2011; 2015).

## 2．研究の目的

This longitudinal research project developed an informal environment in which students could freely practice research skills with students in other parts of Japan through face-to-face meetings and video conferencing. The researchers developed a Tandem Language Learning (TaLL) scheme, which enabled young scientists to improve scientific language skills through language and cultural exchange, sharing research ideas and peer reviewing research projects. A Curriculum Analysis framework addressed policy, practice, and process. The TaLL program was implemented, evaluated, and redesigned based on learner feedback. Through this study, the researchers aimed to identify areas that learners needed to improve to perform more effectively in professional contexts.

## 3．研究の方法

The following research questions guided the study:

- How is meaningful interaction being incorporated into the present curricula?
- What skills do learners need to perform effectively in professional research contexts?
- How can TaLL be designed to benefit learner needs?
- What are the challenges and benefits of TaLL?

Figure 1 illustrates the stages of the research design. Interviews with language teachers and learners provided the data to analyze the curriculum. The TaLL design framework was founded upon social constructionist pedagogy (Vygotsky, 1962; Knowles, Holton & Swanson, 1998; Brookfield, 1986). The key point of this constructivist environment was promoting the following pedagogic and holistic ideals:

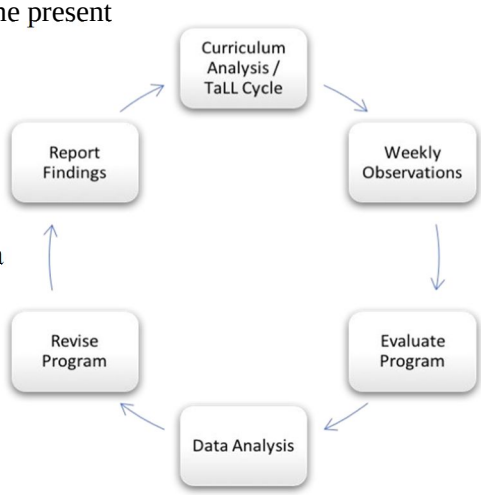

Fig. 1 Research design

- Learner control: Students decide content and theme
- Authenticity: Language and situation is real
- Flexibility: Students can come and go as they wish
- Freedom of choice: Students are free to participate or not
- Reflexivity: Think about the benefits of participation
- Interaction: Be natural and get to know each other
- Cultural sensitivity: Be aware of cultural differences and try not to offend

After analysis of the current curriculum and identifying gaps, the Informal Learning Environment for Academics and Researchers through Networking (*iLearn*) project was established. Four points emphasized in iLearn were as follows:

1. linguistic competence
2. knowledge-sharing for real-life contexts
3. intercultural exchange
4. connection to the university's educational philosophy and policies

Before the program began, a survey was administered to identify learner needs. Based on this information, the program was designed. The program went through two annual cycles. Improvements were made based on learner evaluations and researcher reflections. In the first cycle, a longitudinal, descriptive case study design explored linguistic competence in using research language; and a grounded theory approach analysed meaningful discourse in dialogic exchanges. In the second cycle, content analysis of peer-review exchanges of posters and scientific papers helped the authors to identify, categorize, and analyze meaningful exchanges between students.

## 4．研究成果

### *Article 1 Summary of Results*

McCarthy, T.M., & Armstrong, M. I. (2019). Developing an Informal Tandem Learning Scheme for Young Researchers and Academics. *IAFOR The International Academic Forum*, 747-753.

The first step of the project was to conduct a curriculum analysis to identify if the underlying principles were embedded within the curriculum and teaching practices. A Curriculum Analysis framework was developed to address three areas: (1) Policy (2) Practice and (3) Process (see Figure 2). Each area was explored to identify the connection to the curricular vision, mission and directives (VMDs) of the institution. Analysis of syllabi showed that in line with curricular VMDs, the syllabi reflected the underlying philosophy of the university. For the purpose of TaLL, the researcher tried to identify if there were any gaps in the curriculum that could help frame the TaLL program. These gaps became part of the TaLL design. Three main weaknesses which became apparent were the uneven balance of skills, lack of authenticity in language materials and transferable skills for scientific research practices. These gaps in the curriculum became the starting point for establishing *iLearn*. Following this, the TaLL program was implemented, evaluated, and redesigned based on learner feedback.


Fig. 2 *Curriculum Analysis Framework*

### *Article 2 Summary of Results*

McCarthy, T. M., & Armstrong, M. I. (2021). Overcoming Language Barriers and Boundaries: Video-Mediated eTandem. *Bulletin Suisse de Linguistique Appliquee No special 2021*(2), 183-202. ISBN 978-1-105-52912-2.

Of the participants in the first cycle of the program, 20% were Japanese. International students came from China, Vietnam, Cambodia, Korea, Bangladesh, Taiwan, and Thailand. As such, students were able to improve linguistic competencies as well as increase their awareness of different cultures through communication about research. The *iLearn* model followed current trends in educational practices of synergizing formal classroom learning and informal out-of-class learning (such as blended or self-access language learning), but with the language of scientific research being the focus. In this sense, the *iLearn* program became unique among typical TaLL projects conducted in other settings. Fig. 3 illustrates the organizational components of iLearn. Data were collected by two methods.

First, a case study of a tandem dyad showed improvements in linguistic choices after a 14-week partnership. Over the weeks, there was a noticeable improvement in vocabulary, fluency, and accuracy in scientific expressions which showed developmental progress. This was mainly due to the collaborative nature of the project in which partners could mutually benefit from the relationship. Second, meaningful discourse was examined and analysed through peer-correction activities. For the researchers, engaging in meaningful exchanges signified an exchange of knowledge or critical reflection on learning which could be of mutual benefit to students in a real-life research context (feedback or advice), rather than simply an exchange of information (greetings or sharing of personal information). Through qualitative coding patterns in the data were found by identifying five recurring themes: Poster/PowerPoint design, research content, delivery, organizational structure of research presentation and specialized lexis. The lack of focus on syntax was initially surprising, as Japanese students typically tend to focus on form over content. However, on reflection, as the participants shared a similar status of researcher at one of Japan's top research institutions, they tended to focus their attention on the research content. The researchers noted that any gains in these areas varied significantly between individuals and may have been more the result of more from multiple efforts over the period rather than from the collaborative experience, per se.

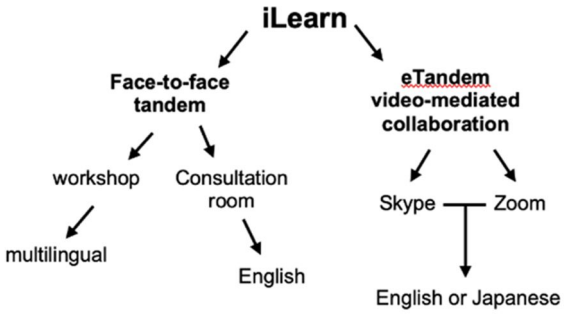


Fig. 3 *iLearn Tandem Model*

***Article 3 Summary of Results***

Armstrong, M. I., & McCarthy, T. M. (2021). Active participation in a sci-tech community: The impact of collaborative peer review. In P. Clements, R. Derrah, & R. Gentry (Eds.), *Communities of teachers & learners*. JALT, 215-223. https://doi.org/10.37546/JALTPCP2020-27

In the second cycle of *iLearn*, there was more focus on dialogue in professional research contexts. In particular, the researchers found discussion circles, networking sessions, and peer review on research proposals, papers, and posters to be the most suitable tasks for collaborative and social engagement. Peer-review proved to be the most suitable collaborative activity to trigger learning mechanisms as learners were able to critically reflect on and evaluate their own and other students' performance. Content analysis of peer-review exchanges of posters and scientific papers helped the authors to identify, categorize, and analyze meaningful exchanges between students. Utterances that highlighted the four taught conventions were sorted into the following categories: (1) Formatting, which referred to general organization and layout; (2) Mechanics, which focused on lexical choices, syntax, and spelling; (3) Content, which examined the research hypothesis, soundness of methodological procedure and data collection, and logic and accuracy of data analysis; and (4) Design, which consisted of comments about poster visuals and ease of understanding of tables and figures in papers. The percentage breakdown of utterances in the four categories is shown in Figure 4.

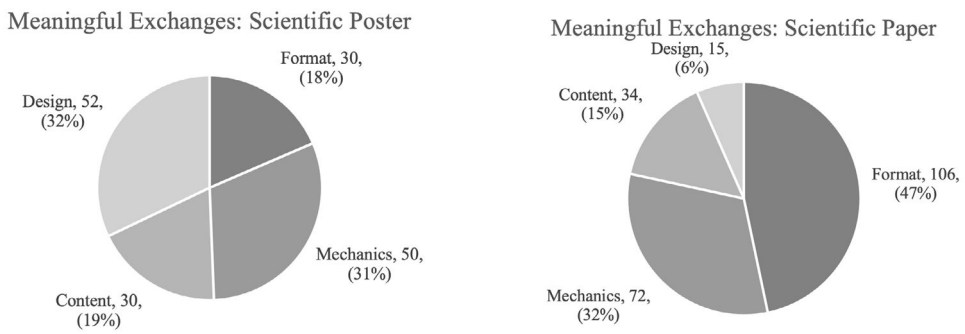


Fig. 4 *Meaningful Exchanges: Scientific Posters and Papers*

One of the concerns in this study noted by the researchers, however, was the quantity of one-way communication between writer and reviewer rather than a two-way, iterative dialogic process. The strength of peer review lies in the co-construction of knowledge through dialogue, as typically it is the giver that benefits from using higher-order thinking processes. The researchers found that it is imperative that the focus be placed on improving meaningful two-way dialogue rather than asking students to simply give critical feedback. Notwithstanding, based on the analysis of meaningful exchanges in peers' dialogic interactions, it was concluded that programs such as *iLearn* can help sci-tech students understand how to critically evaluate their own and their peer's learning performance, become more socially connected to students in different fields, increase intercultural awareness, and prepare them to act in a professional manner in real-life contexts.

**Article 4 (to be published 11/2023)** as part of an invited collection of papers in a book

**Article Title:**

McCarthy, T. (To be published 2023). Collaboration, Reciprocity, and Challenges: Professional Development-in-Practice. In G. Erickson, C. Bardell, and D. Little (Eds.), *Collaborative Research in Language Education: Reciprocal Benefits and Challenges*. Berlin: Mouton de Gruyter.

When the project was near completion, the researchers reflected on insights gained. Five core principles of collaborative learning and research were identified: Building dynamic relationships; facilitating autonomous learning; creating and transferring knowledge and skills; sharing knowledge and resources; and promoting professionalism. Three distinct partnerships emerged during the program: student/student, researcher/student, and researcher/researcher. The central aspects underpinning all partnerships were the benefits of collaboration and reciprocity, and the challenges faced and overcome. It was found that the collaborative partnerships functioned effectively when individuals identified shared problems and devised solutions, made personal breakthroughs, and committed to the collective's as well as the individual's needs. Reciprocity was achieved through dyadic relationships that lasted for a long duration of time and had a meaningful impact. Challenges confronted were mainly scheduling, trust, and technological issues.

The project concludes with the thought that as current research trends continue to shift to global collaborative and interdisciplinary initiatives, it is beneficial to provide institutional-wide training programs for young researchers to meet research requirements and prepare them for the professional life they will experience post-graduation.

There were also questions which remained unanswered at the end of this research: What does professionalism education mean to graduate students? Do educational practices at the university prepare students adequately for their professional life beyond the walls of the classroom? What is the gap between language learning in the classroom and language use in the real world? To answer these questions, the notion of graduate student professional development needs to be unpacked so that students can more accurately understand the specific skills, knowledge, and experiences that will be required for research positions, government employment, and industry settings. To this end, the researcher has begun a second collaborative initiative[1] involving university professors, graduate students, and industry experts.

[1] Research carried out with the support of a JSPS Grant-in-Aid for Scientific Research <KAKENHI> grant, project number 22K00788.

５．主な発表論文等

〔雑誌論文〕　計3件（うち査読付論文　2件／うち国際共著　2件／うちオープンアクセス　3件）

| | |
|---|---|
| １．著者名<br>Matthew Armstrong, Tanya McCarthy | ４．巻<br>- |
| ２．論文標題<br>Active Participation in a SciTech Community: The Impact of Collaborative Peer Review. In P. Clements, R. Derrah, & R. Gentry (Eds.), Communities of teachers & learners. | ５．発行年<br>2021年 |
| ３．雑誌名<br>JALT2021 | ６．最初と最後の頁<br>215-223 |
| 掲載論文のDOI（デジタルオブジェクト識別子）<br>10.37546/JALTPCP2020-27 | 査読の有無<br>有 |
| オープンアクセス<br>オープンアクセスとしている（また、その予定である） | 国際共著<br>該当する |

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| １．著者名<br>Tanya McCarthy, Matthew Armstrong | ４．巻<br>- |
| ２．論文標題<br>Overcoming Language Barriers and Boundaries: Video-Mediated eTandem | ５．発行年<br>2021年 |
| ３．雑誌名<br>Bulletin Suisse de Linguistiquee Appliquee special 2021(2) | ６．最初と最後の頁<br>- |
| 掲載論文のDOI（デジタルオブジェクト識別子）<br>なし | 査読の有無<br>有 |
| オープンアクセス<br>オープンアクセスとしている（また、その予定である） | 国際共著<br>該当する |

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| １．著者名<br>Tanya McCarthy and Matthew Armstrong | ４．巻<br>- |
| ２．論文標題<br>Developing an Informal Tandem Learning Scheme for Young Researchers and Academics | ５．発行年<br>2019年 |
| ３．雑誌名<br>The Asian Conference on Education 2019 Official Conference Proceedings | ６．最初と最後の頁<br>747-756 |
| 掲載論文のDOI（デジタルオブジェクト識別子）<br>なし | 査読の有無<br>無 |
| オープンアクセス<br>オープンアクセスとしている（また、その予定である） | 国際共著<br>－ |

〔学会発表〕　計6件（うち招待講演　0件／うち国際学会　6件）

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|---|
| １．発表者名<br>Tanya McCarthy and Matthew Armstrong |
| ２．発表標題<br>Tandem Learning Revisited: Autonomy, Reciprocity, and Collaboration |
| ３．学会等名<br>AILA2020（国際学会） |
| ４．発表年<br>2021年 |

１．発表者名
Tanya McCarthy

２．発表標題
Corrective peer-feedback in an ICT Academic Writing context

３．学会等名
ISSDL (The International Self-Directed Learning Virtual Summit) 2021（国際学会）

４．発表年
2021年

１．発表者名
Matthew Armstrong and Tanya McCarthy

２．発表標題
Widening Participation in a SciTech Community

３．学会等名
JALT2020（国際学会）

４．発表年
2020年

１．発表者名
Tanya McCarthy and Matthew Armstrong

２．発表標題
iLearn: A SciTech English initiative to increase outreach

３．学会等名
EUROCALL2020（国際学会）

４．発表年
2020年

１．発表者名
Tanya McCarthy and Matthew Armstrong

２．発表標題
Developing an Informal Tandem Learning Scheme for Young Researchers and Academics

３．学会等名
ACE2019: The Asian Conference on Education 2019（国際学会）

４．発表年
2019年

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| １．発表者名<br>Tanya McCarthy and Matthew Armstrong |
| ２．発表標題<br>Overcoming language barriers and boundaries: Video-mediated eTandem collaboration |
| ３．学会等名<br>VALS-ASLA2020（国際学会） |
| ４．発表年<br>2020年 |

〔図書〕　計1件

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|---|---|
| １．著者名<br>Tanya McCarthy | ４．発行年<br>2023年 |
| ２．出版社<br>Mouton de Gruyter | ５．総ページ数<br>- |
| ３．書名<br>Collaboration, Reciprocity, and Challenges: Professional Development-in-Practice. In G. Erickson, C. Bardel, and D. Little (Eds.),Collaborative Research in Language Education: Reciprocal Benefits and Challenges. | |

〔産業財産権〕

〔その他〕

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６．研究組織

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７．科研費を使用して開催した国際研究集会

〔国際研究集会〕　計0件

８．本研究に関連して実施した国際共同研究の実施状況

| 共同研究相手国 | 相手方研究機関 |
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