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研究課題名(和文) Engineering English for the Growth Mindset in the Knowledge-Creating Classroom

研究課題名(英文) Engineering English for the Growth Mindset in the Knowledge-Creating Classroom

研究代表者

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研究成果の概要(和文)：2016年以降、デーモン・チャンドラー博士と私は、特に3年生の必修科目アカデミック・イングリッシュにおいて、英語スキルの学習及び維持における重要な動機付けの要因として「成長マインドセット」を研究してきました。これには「話す」、「聞く」、「質問に回答する」、「プレゼンテーションの原稿を書く」などが含まれます。多数の学生がグループワークを必要としたため、私たちはチームとリーダーに焦点を当てました。各コースの最初と最後に生徒の英語を評価しました。3年後、私たちは暫定的な結論を提案します。「リーダーのいるチームは、グループで編成されたクラスよりも英語をよりよく学びます。」

研究成果の学術的意義や社会的意義

Our collaboration of EEE Science and Behavioral Science was guided by the goal of constant improvement. We suggest that adult science students could be offered the complex challenges of interpersonal communication, people skills, and social interaction in the general scientific world of their major.

研究成果の概要(英文)：Since 2016 Dr. Damon Chandler and I have been researching The Growth Mindset as an important motivating factor in learning and retaining English language skills, specifically for the required 3rd year required class Academic English. These include speaking, listening, responding to questions, and writing scripts for presentations. The large number of students required group work; hence we focussed on TEAMS and LEADERS. At the beginning and end of each course we evaluated the students English. After 3 years we to propose our tentative conclusion. "Teams with leaders learn English better than classes organized into groups."

研究分野：Collaborate learning

キーワード：Team building Leadership Presentation skills English language skills Project Based Learning

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## 様式 C - 19、F - 19 - 1、Z - 19 (共通)

### 1. 研究開始当初の背景

We began our first collaboration in 2016. I was assisting the lecture Academic English for Electrical and Electronic Engineers. Lectures in English put the students to sleep immediately. We wanted a better way. As we talked of Experiential Learning (EL) and Project Based Learning (PBL), Carol S. Dweck's "mindset psychology" was trending, so we experimented with the "flipped classroom." We received the Kakenhi Grant for 2017-2019, aiming for the "Growth Mindset."

I had been working with "Presentation" and presentation skills for several years. I taught Power English to Faculty of Engineering freshmen. One of my ideas was to ask students to present their ideas as a Power Point Presentation in front of their peers, soon to be friends and colleagues. I was influenced by Michael Polanyi's 2006 *The Tacit Dimension*. I came to believe that students speaking and working together in groups and teams and making presentations before each other was an effective way of building a good learning environment. I was steadily moving a way from the "lecture model" of university classes to the "workshop" model. The teacher in the lab, moving among the students as they work on experiments, is a great role model.

So we taught Wednesday afternoon and Friday morning Academic English classes to EE students for three years. The two classes made it possible for us to do an experiment involving the Wednesday class in AE class with teams with leaders while the Friday morning class had "undifferentiated" groups. These groups or TEAMS had to make three presentations through the semester. We ran the class as a "Poster Conference."

When we evaluated the final English scores we discovered that the Wednesday class with Teams with Leaders had statistically significant better scores than the Friday class with "group."

Our grant technically ended in 2019. We provisionally stated, "Teams with Leaders learn English Better." Then the Corona Virus arrived. We had already decided to teach the two classes as one, along the same lines: Do a brief English assessment, and with the results of evaluation in hand, set up the 100-120 student class into teams. We asked them to choose a leader, choose a name, and take a team shot.

### 2. 研究の目的

The purpose of the research was to find a way of presenting Academic English to 3<sup>rd</sup> year Shizuoka University Faculty of Engineering students that would 1) inspire the "growth mindset," train Power Point Presentation skills, such as making attractive slides, writing scripts, and delivering the presentations in English. The presentations would be done as team projects.

### 3. 研究の方法

Since we were teaching Academic English, the measurable results would be in English proficiency. The problem is, how do we test this? The preliminary assessment done on Day One in the class and the final assessment, done on the last day of class, provides the best quantifiable results.

### 4. 研究成果

One result from one student. We evaluated the Primary Assessment of student 5005-1011 on the basis of content, grammar and vocabulary and sentence formation.

The assignment was to write about a ball game such as soccer or basketball. This student professed that he didn't know much about the games. He wrote complete sentences that were understandable. It was good enough. None of us gave him a high score; we reckoned that he was "better than average."

However, when we read his Final Assessment, we were deeply impressed. After the semester's work in design, structure, procedures and so on, he discussed how the work of making presentations in his team had given him good opportunities to develop. He was able to express the whole process of team formation from the beginning. He described how he had accepted the teacher's assignment of the team

members with whom he had to work. He worked with the obstacles that the team faced and what his role was in resolving them. He could understand his contribution but was glad to help the members of his team achieve more. He could tell what he learned from Academic English about “drone design” and presentation skills.

Actually one of the members of our team of evaluators asked, “How did this student go from “average” to a well-rounded, well-informed student?” How was he able to see the whole picture, of how Academic English fit in his whole curriculum to develop his skills prior to choosing or being assigned to his Seminar Professor, who would oversee the last year of his university education. What was in the class to teach him all of this?

The first assessment was an opportunity to hear a question and start writing in English for 20 minutes about a ball game. We have 120 essays of students attempting to write as much as they can about their sport, and this singular student’s essay was a good “average.”

In his Final Assessment he was easily using structure formation in sentences, he revealed the temporal outline of his development as well as the realizations that built his character in the process. By the time he wrote the Final Assessment, he and his team had done three presentation as they designed the concept, blueprint, and development of a drone or robot. He got a good grip on the language of his field, the problems of design, materials, and all sorts of integrated understanding, not only in English, but in his relationships with team members.

Simply, the active learning that is contained in Designing a Drone or Robot for a Specific Purpose in a Specific Environment together with his team and the leader pushing and inviting them to contribute was sufficient to pull his deep knowledge of both English and his training together into something coherent.

Our approach to Academic English asks students to make three presentations in a team to be presented by the team. They must talk to each other, make slides together, and stay on good terms no matter what, so that they can achieve their presentation by the deadline. Of course, the details and statistical analysis of our results must wait until a later date.

The End

## 5. 主な発表論文等

〔雑誌論文〕 計4件（うち査読付論文 4件/うち国際共著 3件/うちオープンアクセス 0件）

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〔図書〕 計0件

〔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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