

|              |                                                                                   |
|--------------|-----------------------------------------------------------------------------------|
| Title        | 小学校高学年児童を対象とした概念を用いた創造性教育教材の開発と評価                                                 |
| Author(s)    | 尾澤, 知典                                                                            |
| Citation     |                                                                                   |
| Issue Date   | 2023-03                                                                           |
| Type         | Thesis or Dissertation                                                            |
| Text version | ETD                                                                               |
| URL          | <a href="http://hdl.handle.net/10119/18403">http://hdl.handle.net/10119/18403</a> |
| Rights       |                                                                                   |
| Description  | Supervisor: 由井 蘭 隆也, 先端科学技術研究科, 博士                                                |

|         |                                   |               |     |
|---------|-----------------------------------|---------------|-----|
| 氏名      | 尾澤 知典                             |               |     |
| 学位の種類   | 博士 (知識科学)                         |               |     |
| 学位記番号   | 博知第 320 号                         |               |     |
| 学位授与年月日 | 令和 5 年 3 月 24 日                   |               |     |
| 論文題目    | 小学校高学年児童を対象とした概念を用いた創造性教育教材の開発と評価 |               |     |
| 論文審査委員  | 由井 薫 隆也                           | 北陸先端科学技術大学院大学 | 教授  |
|         | 西本 一志                             | 同             | 教授  |
|         | 敷田 麻実                             | 同             | 教授  |
|         | 白肌 邦夫                             | 同             | 准教授 |
|         | 西浦 和樹                             | 宮城学院女子大学      | 教授  |

### 論文の内容の要旨

The purpose of this study is to develop and evaluate creativity education materials using “Concepts” for upper elementary school students.

Creativity here is defined as skills to generate novel, appropriate and valuable ideas. The criterion is “mini-c” that is the ability to make new interpretations that are personally meaningful. Creativity education is for that. It has been required to be implemented and deepened. But the education has not been enough, especially in primary schools. There are some reasons as to why. Firstly, the definition of creativity is not sufficiently developed. Secondly, it is difficult to define the teaching and to develop the evaluation methods. Thirdly, there are little classes which are focused on enhancing the idea generation skills. it is normal that we have subject classes in schools. There are some previous studies that are pragmatic and educational approaches using creative tools, and that are the cognitive approaches that attempt to understand the process of creative activities. However, when creative tools are used, the quality of the outcomes are varied. When current cognitive approaches are implemented, it is artificial and too simple such as combining shapes and words.

In order to solve them, a clue was taken from the cognitive approach that enables educational support, especially in dealing with the mental representations that underlie the creative thinking. “Concept-Based Curriculum and Instruction” was used at the International Baccalaureate (IB). Using the Concept which is abstraction of fact is an attempt to transfer what students have learned to other learning situations. It is showed that Concept is efficient not only for subject learning, but for creativity education. However, specific methods for creativity education are not well practiced. Therefore, it is expected to apply this Concept to creativity education. We have variety of “Concepts” other than abstract concept. Development of the educational materials for practicing to deal with the concrete and ordinal concept as well as abstract concept which is also used in the IB.

The first of the proposed materials is the “Pump Chart”. It deals with abstract and concrete concept. It was designed to practice concrete and abstract thinking style. Brainstorming was used as a comparison to the “Pump Chart” As a result, it was confirmed that there were no problems in terms of understandability and usability, and availability (fluency, flexibility, and originality). This showed how significant for the students. In

addition, the intention to use the “Pump Chart” is also confirmed. These effect sizes were also large. These results confirm that the “Pump Chart” can be used as teaching materials for practice.

The second proposed material is “Look Like Chart.” It is an educational tool that deals with abstract and concrete concept. It was designed to practice abstract and concrete thinking style. “Mind Map” was used as a comparison to the “Pump Chart.” As a result, it was confirmed that there were no problems in terms of understandability and usability. It was also confirmed that availability (fluency, flexibility, and originality) has the almost the same effect as “Mind Map.” In addition, the intention to use the “Look Like Chart” was significant. The effect size was also significant. These results confirm that “Look Like Chart” can be used as teaching materials for practice in the classroom.

The third proposed material is the “And Then Map.” It deals with ordering concept. It was designed to practice to how to add on one phrase by asking “And Then” multiple times to future. Brainstorming was used as a comparison to the “Look Like Chart.” As a result, it was confirmed that there were no problems in terms of understandability and usability, and availability (fluency, flexibility, and originality). And the significancy was showed. In addition, the intention to use “And Then Map” is also significant. These effect sizes were also significant. These results confirm that “And Then Map” can be used as a teaching material for practice.

Key Words: Creativity education, mini-c, Concepts, Pump Chart, Look Like Chart, And Then Map

## 論文審査の結果の要旨

近年、21世紀スキルとして、既にある知識や技能を学ぶだけでなく、何か新しいことを導く創造性が重要となっている。そのため、ブレインストーミングなどの創造技法や創造性に関する経験的なものを文献学的に整理した創造性教育が検討され、様々な教材・ワークショップ・カリキュラムが提言・実施されてきている。一方、最新の研究室実験で得られた知見を用いた創造性教育の設計が学習科学・心理学かつ創造性研究の専門家から示されているが、従来の知識移転型の教育と統一的な視点で検討されてはいない。その中、本研究は国際バカロレアに適用されている知識移転を狙った概念ベースのカリキュラム設計と概念操作を通して創造性を理解・説明しようとする創造的認知研究を統合した取り組みとなっている。特に、新たな創造性教育の方向性として、概念を扱える能力を創造性教育の基礎とする教材開発を行った点は国際的にも特筆すべき成果となっている。

具体的に、創造性教育のための3つの教材を開発し、概念を扱う能力として、抽象化、具象化、そして、時間変化を扱うものを対象としている。教材1：ポンプチャートは抽象化、具象化の操作を扱うものであり、複数の言葉・文章から概念（まとめの言葉）を導出し、そして、その概念から思いつくアイデアを自由に記述するものである。教材2：Look Like Chartは、抽象的な言葉から出発して、そこから思いつく要素や具体的なアイデアを自由に記述するものである。教材3：するとどうなるマップは時間変化を扱うものであり、現在の状態から、行動によって、どのような状態に変化するかを自由に記述していくものである。

これら教材評価を評価するために行った授業では、創造性の初歩的目標として、mini-C（モノゴトに対して個人的に意味のある新しい解釈する能力）を育むことを目的としている。そして、小学校高学年児童を対象とした教育実践において、児童の立場から見ての有効性（流暢性・柔軟性・独自性）、使用志向性を中心に評価した。その結果、教材1と教材3はブレインストーミングと比較し

て、いずれの項目でも児童の評価が高いこと、教材2はマインドマップと比較して、いずれの項目でも児童の評価は同等であることを示している。また、児童から集めたアンケート内の自由記述に対して、KH-Coderを用いたテキスト解析によって各教材が児童に与えた影響を考察しており、定量的・定性的にも興味深い創造性教育の分析成果となっている。

以上、本論文は、創造性教育の基礎となりうる概念ベースとする創造教育教材の設計方針を提示し、開発した教材を小学校現場において実践・評価し、その効果を示したものであり、学術的に貢献するところが大きい。よって博士（知識科学）の学位論文として十分価値あるものと認めた。