Incorporating Mind-mapping with Initial Activities Design in Courses for Pre-service Teachers of Visual Arts

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一、Research Questions
二、Limitations
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四、Research Methods
五、Content Analysis
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Research Questions

1. Is it possible to pinpoint the problems of curriculum design from the mind maps drawn by pre-service teachers?

2. What are the teaching strategies to be applied when using visual organizer in pre-service teaching courses?
II. Literature Review

i. visual organizer

According to cognitive-developmental theory, learning is achieved when learners actively construct knowledge through assimilation and accommodation. To learners, effective transfer of learning can be facilitated when the content of the course is well-structured.
The application of visual organizer can be traced back to the concept map proposed by Joseph D. Novak and Bob Gowin. Their research on students’ scientific understanding conducted in 1970s has indicated that concept maps indeed have positive impact on enhancing students’ learning understanding.

The result of the study also corresponds to what Ausubel had proposed, that is, the factor that influences learners the most is what they have already learned.
Seasons are determined by the amount of sunlight, which results in seasonal temperature variations.

Amount of sunlight is determined by the length of the day and the height of the sun above the horizon.

Length of day is longer in summer and shorter in winter.

Height of sun above horizon is higher in summer and lower in winter.

23.5 degrees tilt of axis determines the position in orbit. In summer, the axis points towards the sun, while in winter, it points away from the sun.

Position in orbit with slight variation in distance has negligible effect on the variation of sunlight.
Different from concept maps, **mind maps** encourage the expression of thoughts through images. In fact, mind maps are often confused with concept maps.
According to Buzan, it takes certain procedures and methods to form a mind map, which are as the following:

i. Form an idea or concept in the center of the graphs.

ii. Draw the main branch and add keywords.

iii. Extend sub-branches from the main branch. The sub-branches are developed from thicker ones to thinner ones. Each branch carries only one keyword.

iv. The abstract ideas should be placed in the center. The edgier the ideas, the more concrete they should be.

v. Creators are encouraged to add image design and colors.
Table 1 Summary of the differences between knowledge-mapping software

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Structure</th>
<th>Level of abstraction</th>
<th>Nodes</th>
<th>Linking devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mind maps</td>
<td>Associations between ideas, topics or things</td>
<td>Non-linear, organic, radial</td>
<td>High generality</td>
<td>Pictures, words, diagrams</td>
</tr>
<tr>
<td>Concept maps</td>
<td>Relations between concepts</td>
<td>Hierarchical, tree-like</td>
<td>Medium generality</td>
<td>Boxes</td>
</tr>
</tbody>
</table>

Edwards and Cooper (2010) Mind mapping can be used as a teaching resource to facilitate the teaching experience.
II. Discussion on the History of Visual Art Education and Curriculum Organizers

Reflecting on the development of the education of visual art in Taiwan, the art teaching in the past put more emphasis on performance and making.
It was not until 1965 when scholars such as R. W. Eisner and Bankan proposed that art experience is exclusive to art itself that aesthetic-experience-oriented Discipline-Based Art Education (DBAE) began to develop.

In Discipline-Based Art Education, **art ability is not the result of natural growth but rather the consequence of learning.** It is also emphasized that students are learners, and **what art education should achieve is to help individuals learn to reflect on art experiences.** (Eisner, 1987.) The realization of such a concept is indeed discipline-based art education.
The four main fields defined in Discipline-Based Art Education are: **Aesthetics, Art History, Art Critics, and Art Creation.** (Clark, Day, & Greer, 1987)
In the recent curriculum reform in Taiwan, the focus has been shifted to **the integrated learning and curriculum integration. Studies on integrated curriculum structure regarding visual art education have also appeared.**

Kuo adopted the concept of integrated curriculum structure from Efland and stressed on the **Semi-Lattice structure.** Under such a structure, the aesthetics, art history, art critics, and art creation of DBAE are sequenced and extensively applied in teaching, so as to expand students’ understanding of art and reach the goal of integration.
Figure 5

Discipline-based Knowledge Shown as a Tree Without Overlapping Elements

Discipline-based Art Education

- Studio Studies
- History of Art
- Art Criticism
- Aesthetics

Figure 6

Discipline-based Knowledge Shown as a Semi-Lattice with Partially Overlapping Elements

1. Art Studio
2. Art Criticism
3. Art History
4. Aesthetics

1/2 Studio with Criticism
2/3 Criticism with History
3/4 History with Aesthetics
1/3 Studio with History
1/4 Studio with Aesthetics

Regarding visual art education, **most visual art teachers tend to voluntarily design and organize their teaching materials.** Though curriculum outline and the textbooks do provide certain guidelines and instructions of teaching content and course design, due to the special feature possessed by art subjects, **creative curriculum organization and structure is a characteristic owned by visual art teachers.**
主題

濃情畫意 手不住

目標
1. 欣賞及了解不同時代與文化背景藝術品情感風格特質
2. 認識藝術家的生平與作品特質
3. 了解肢體語言，及其所代表的情緒
4. 體會個人情緒及與藝術形式之間的關係性
5. 應用視覺、音樂與表演藝術表現方法，傳達經驗與思考

時間
總計約需十週，每週上一節課

小主題
各式手機
愛神的手不見了
心手相連
藝術嘉年華

目標
1. 仔細閱讀藝術作品情感表現技巧
2. 描繪畫中世界與創作者的意圖
3. 認識各種不同的藝術品情感風格
1. 想像與表現藝術作品的塊感
2. 以肢體動作描繪劇作表現之情感
1. 以自己生活經驗深入思考手的功能
2. 自選媒材創作表現
1. 計劃與研商表演之內容或情緒與配樂
2. 決定主題撰寫劇情
3. 以肢體演練表現之劇情或動作
4. 發表與評論

時間
一週、一節
一週、一節課
四週、四節
四週、四節

教學資源
1. 十四幅作品彩色複製畫（各組二幅）及於其幻燈片
2. 分組討論學習單（正副一張）
1. 一幅來源的彙納新映幻燈片
2. 創意學習單（每人一張）
1. 立體造型企劃書
2. 自選媒材
1. 主題研究學習單
2. 劇情寫作學習單
3. 服裝道具檢核表
4. 表演欣賞評論學習單

主要教學活動
1. 分組討論
2. 撰寫學習單
3. 各組發表
4. 重複幻燈片講述
1. 討論發表
2. 觀察描繪
3. 立體造型創作
4. 講評討論
5. 教師總結

評量
參與、討論與發表，各式學習單之撰寫、手立體造型作品、戲劇表演
Visual art education **adopts theme-based curriculum design** in order to provide learners with holistic and versatile art learning experiences.
Curriculum maps demonstrate the theme-based integrated teaching structure of art courses, which centers on the themes to set teaching objectives and the content of the teaching and develop strategies of assessment to examine the fulfillment of teaching objectives.

To achieve the goal of the integration of themes as well as different domains, **structural visual organizer** are mostly applied to such multi-disciplinary courses design.
Formally and publically demonstrated courses actually provides pre-service teachers with very limited help. (Kowalchuk, 1999)

Researchers should focus more on how such open courses can help new teachers think critically regarding their curriculum.
Therefore, before the course map is formed, the researcher attempted to organize the course content through mind-mapping, and it was taken as the predecessor activity for the content design. The pre-service teachers are grouped to brainstorm the content of the course and form mind maps.
The research target is the pre-service teachers from Teacher Education Center in National Taiwan University of Art. In the course of teaching materials and methods, students form a group of two to three to create the mind maps for theme-based course design. 12 samples have been collected.
ii. Classification of the Mind Maps

To further probe into the content and message conveyed in the mind maps, the scale, developed by Chiestine Hogan to help analyze the content of mind maps, is applied when classifying the mind maps.
<table>
<thead>
<tr>
<th>Number</th>
<th>Category</th>
<th>Use of color</th>
<th>Branches</th>
<th>Hierarchies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>專屬 logo D.I.Y</td>
<td>18</td>
<td>34</td>
<td>3–7</td>
</tr>
<tr>
<td>2</td>
<td>移動的試點</td>
<td>10</td>
<td>36</td>
<td>3–5</td>
</tr>
<tr>
<td>3</td>
<td>水墨</td>
<td>10</td>
<td>23</td>
<td>2–6</td>
</tr>
<tr>
<td>4</td>
<td>啟發學生創意思考</td>
<td>11</td>
<td>17</td>
<td>2–4</td>
</tr>
<tr>
<td>5</td>
<td>品牌形象</td>
<td>15</td>
<td>14</td>
<td>3–6</td>
</tr>
<tr>
<td>6</td>
<td>認識臺灣傳統藝術文化</td>
<td>9</td>
<td>31</td>
<td>3–4</td>
</tr>
<tr>
<td>7</td>
<td>設計</td>
<td>12</td>
<td>41</td>
<td>3–5</td>
</tr>
<tr>
<td>8</td>
<td>拼貼</td>
<td>7</td>
<td>26</td>
<td>2–5</td>
</tr>
<tr>
<td>9</td>
<td>象徵我象徵</td>
<td>2</td>
<td>18</td>
<td>3–5</td>
</tr>
<tr>
<td>10</td>
<td>藝術與關懷</td>
<td>1</td>
<td>15</td>
<td>3–4</td>
</tr>
<tr>
<td>11</td>
<td>傳統木雕</td>
<td>2</td>
<td>28</td>
<td>3–4</td>
</tr>
<tr>
<td>12</td>
<td>篆刻</td>
<td>2</td>
<td>16</td>
<td>3–4</td>
</tr>
</tbody>
</table>

Resource: researcher collected
The layer structure of the map content generally falls between 3-4 layers, and number of branch distribution varies due to different themes. The greatest number of branches is 41.
V. Conclusion and Discussions

i. Is it possible to pinpoint the problems of curriculum design from the mind maps drawn by pre-service teachers?
The use of colors, distribution and number of branches and layers of trunks for creation and appreciation are quite similar, indicating that students put equal emphasis on both instead of focusing more on either creation or appreciation.
<table>
<thead>
<tr>
<th>Main trunk</th>
<th>Category</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Use of color</td>
<td>branches</td>
<td>hierarchies</td>
<td></td>
</tr>
<tr>
<td>Creation</td>
<td>32</td>
<td>83</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Appreciation</td>
<td>32</td>
<td>94</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Affection</td>
<td>28</td>
<td>43</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

Resource: researcher collected
As for the affection trunk, it is quite obvious that the use of colors, distribution and number of branches and layers are all relatively fewer compared with the trunks of creation and appreciation. From this, we can see that students may encounter greater difficulty in teaching design regarding the affection part.
The Demonstration of Teaching Design: from the abstract to the concrete
We covered too many things in the original mind map because there are so many things we would like to tell our students. However, even we as teachers spent four years to familiarize ourselves with all these, so it seems to be too coercive if we expect students to learn all these within on course, so we finally made some adjustment. (interview)
The Organization and Structure of the Course Content

Reflecting on our original mind map, we found that we covered too many disconnected issues. We had drama, architecture, folk arts, and even religions. If we had narrowed down the issues to be covered, we would have been able to systematically make our courses more coherent. (interview)
II. How can mind mapping be adopted as a teaching strategy in visual art courses?
The structure of the course should follow the vertical and horizontal principle, meaning from simple to complex, concrete to abstract, holistic to partial, past to present, and following the order of stages of learners’ development.
Before developing the course structure, mind maps may help highlight the problems students may encounter when designing. However, it may not be suitable to directly adopt mind maps as the structure of the course design.
學習美術先從最基本的視覺造形要素認知開始。點、線、面，慢慢從一度思維走向 3D。透過創造繪在最簡單的起點，拉近學生與美術表現的距離，透過草間彌生的作品及其表現形式，進入自我內在的潛質，建立美術表現的自信。

認識表現媒材與形式的多樣性，透過水彩、綜合基礎表現技法的實用運用，學生不同的繪畫手法，進而認識水彩的風貌與早期臺灣藝術家水彩作品。利用圈點貼紙的特性加上美的式原始與構成原理及色彩學的認知運用於包裹紙袋與卡片製作。

將前面美的形式原理、視覺設計概念構成原理、點線面表現技法，從平面延展到立體空間表現，加入光的元素，創造工藝裝飾裝置校園景觀。
Courses must be organized and structured systematically. Therefore, the structure of course design is often presented in the form of concept maps.
Eisner, E. (1996) Regarding teaching plans, course designers cannot solely rely on formulas and principles but need to have skills, vision, imagination, and good judgement. They need to imagine while conceptualizing and to feel when organizing, like an artist creating an image that corresponds to the objective. 
In recent years, the concept of integration, namely the horizontal connection among subjects, has been increasingly emphasized. The potential of mind maps indeed originates from its nature of initiative and collaboration. (Budd, 2014)
Horizontally connecting multi-disciplinary content facilitates the integrated learning in the art domain. Hence, the research believes that in the stage of developing courses and integrative thinking, mind maps can take complimentary effect. However, the exact effectiveness is still to be explored in future research.
Thank you