

## บทความปริทัศน์: การส่งเสริมความคิดสร้างสรรค์ของนักศึกษามหาวิทยาลัย

### ในหลักสูตรศิลปะ ออกรูป และการถ่ายภาพ

### A Review: Supporting Students' Creativity in Art Design and Photography Classes in University

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#### บทคัดย่อ

ความคิดสร้างสรรค์เป็นหนึ่งในเป้าหมายทางการเรียนที่สำคัญในระดับมหาวิทยาลัย แต่ข้อมูลการวิจัยที่เกี่ยวข้องกับความคิดสร้างสรรค์ในหลักสูตรการถ่ายภาพยังมีอยู่น้อยมากเมื่อเปรียบเทียบกับหลักสูตรศิลปะ การออกแบบ และหลักสูตรอื่น ๆ ดังนั้นจุดประสงค์ของบทความนี้คือเพื่อสร้างความเข้าใจเกี่ยวกับการส่งเสริมให้เกิดความคิดสร้างสรรค์ในหลักสูตรการถ่ายภาพผ่านการวิเคราะห์ สังเคราะห์ และประยุกต์องค์ความรู้จากการวิจัยด้านศิลปะและการออกแบบ เพื่อนำเสนอค่าdam การวิจัยคือ “องค์ประกอบอะไรที่ช่วยส่งเสริมความคิดสร้างสรรค์ทางด้านศิลปะและการออกแบบ และสามารถประยุกต์ใช้กับหลักสูตรการถ่ายภาพได้อย่างไร ?” ผู้วิจัยได้ทบทวนวรรณกรรมจากฐานข้อมูล Scopus, ScienceDirect (ฐานข้อมูลหลัก) และ Google Scholar (ฐานข้อมูลรอง) ผ่านคำสำคัญ 3 คำ โดยได้งานวิจัยทั้งสิ้น 1,449 บทความและคัดเลือกเหลือ 84 บทความในช่วงปี ค.ศ. 2010 ถึง 2022 ผู้วิจัยใช้วิธีการวิเคราะห์เชิงเนื้อหา (Content analysis) และสรุปอ้อมาได้ 4 กลุ่ม 23 หัวข้ออย่าง โดยทั้ง 4 กลุ่มประกอบด้วย: 1) การออกแบบหลักสูตรสร้างสรรค์ (7 หัวข้ออย่าง); 2) การสร้างห้องเรียนสร้างสรรค์ (7 หัวข้ออย่าง); 3) การสอนเชิงสร้างสรรค์ (5 หัวข้ออย่าง); 4) คุณลักษณะของนักศึกษา (4 หัวข้ออย่าง) บทความนี้นำเสนองรอบแนวคิดการวิจัยเพื่อสนับสนุนการเรียนการสอนในหลักสูตรศิลปะ การออกแบบ และการถ่ายภาพให้เกิดความคิดสร้างสรรค์ ที่ครอบคลุมทั้ง 4 ด้าน (หลักสูตร ห้องเรียน การสอน และนักศึกษา) เพื่อส่งเสริมความคิดสร้างสรรค์ของนักศึกษาในระดับมหาวิทยาลัยและยังสามารถประยุกต์ใช้กับหลักสูตรอื่น ๆ ได้

**คำสำคัญ:** ความคิดสร้างสรรค์ ศิลปะ การออกแบบ การถ่ายภาพ มหาวิทยาลัย

#### Abstract

Creativity has become one of the most significant learning goals in universities. However, there has been less research supporting this in photography classes compared to art and design (or other) classes. Therefore, the aim of this review article is to contribute understanding about supporting creativity in photography classes by reviewing, analyzing, synthesizing, and applying studies from art and design research

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to propose this research question: “What elements that help foster creativity in art and design classrooms could be applied to photography classes, and how?” We searched the literature reviews on Scopus, ScienceDirect, and Google Scholar (as a secondary database) for three main keywords, retrieving 1,449 articles, then narrowing these down to 84 from the period 2010 to 2022. We applied content analysis with thematic coding to these articles and collected them into four groups with 23 themes as follows: 1) Designing creative curriculums (seven themes); 2) Constructing creative classrooms (seven themes); 3) Creative teaching (five themes); 4) Students’ characteristics (four themes). This review will also present a framework for a creative art design and photography class that covers all four categories (from curriculum, classroom, teaching, and students) to facilitate the development of creativity in university students and could be applied into other classes.

**Keywords:** Creativity, Art, Design, Photography, University

## 1. Introduction

In the past, the goal of teaching was the conveyance of facts and procedures. The criteria used to determine the success of classroom instruction involved tests on how many of these the students could remember. However, the world has changed; memorizing only facts and procedures is now not enough for success. University students need to approach new concepts, ideas, or knowledge with creative thinking (Chang, Wang, Haynes, Song, Lai & Hsieh, 2022; Hall & Thomson, 2017; Sawyer, 2017).

As a consequence, creativity has become one of the most significant learning goals in universities (Florida, 2019; Wei, Lacaste, Rodliyah, Nguyen & Chuang, 2022). Several national educational policies around the world now prioritize creativity so that students can solve problems, apply existing knowledge, create innovation, and prepare themselves for life beyond the classroom (de Bruin & Harris, 2017; Lucas, Claxton & Spencer, 2013; Wei et al., 2022).

In art and design education, these curriculums have been widely recognized as a kind of creative thinking and practice. However, previous research has focused on creativity in general art and design classes, not that which is specific to photography classes. Additionally, most of them are not related to creative photography classes. They have mainly focused on photography as a medium for conducting research.

As a consequence, no studies have solely analyzed how to support students’ creative skills in photography classes. Therefore, the aim of this review is to contribute understanding about supporting creativity in photography classes by reviewing, analyzing, synthesizing, and applying studies from art and design research. Moreover, this review sets up this research question: “What elements that help foster creativity in art and design classrooms could be applied to photography classes, and how?”

## 2. Methods

Researchers adopted a rigorous methodology recommended for a systematic literature review (Aveyard, 2010; O’Brien & Guckin, 2016) as follows.

## 2.1 Developing Inclusion and Exclusion Criteria

The inclusion and exclusion criteria for this review were selected according to our aim of contributing understanding about how to support creativity in photography classes. We reviewed, analyzed, synthesized, and applied studies from art and design research, as illustrated in Table 1 below:

**Table 1** The criteria for inclusion and exclusion of the literature

Inclusion	Exclusion
Peer review studies in English	Non-English studies
Publication during 2010–2022	Publications outside the timeframe were not selected.
Journals; conference proceedings; textbooks; book chapters; organization websites	Working papers; conference abstracts; conference reviews
Categories: Arts and Humanities; Social Sciences; Business Management and Accounting; Psychology	Categories: Medicine; Mathematics; Environmental Science; Engineering; Agriculture; Computer Science; Physics; Astronomy

## 2.2 Keyword Search in Databases

At this stage, researchers set up keywords as follows:

creative AND art OR design OR photography AND teach OR class

These keywords represented a broad search string to ensure we were covering all related studies. Next, the researchers looked for studies from two major databases in the social sciences and design categories: Scopus and ScienceDirect, with Google Scholar as a secondary database. (When the information was not available on Scopus or ScienceDirect, Google Scholar was used.) This combination of three databases covered all academic literature from journals, conference proceedings, books, and organization websites from 2010 to 2022 in order to gather information from the past for comparison with the existing knowledge. Next, the search terms were used for titles, abstracts, and keywords from the databases mentioned. The results from the keywords are illustrated in Table 2.

**Table 2** Results of studies in the databases

Database	Search terms (titles, abstracts, keywords)	Total (first pass)	Second pass	Time
Scopus	creative AND art OR design OR photography AND teach OR class	1459	84	2010–2022
ScienceDirect		152		
Google Scholar	creative AND photography AND teach OR class	119	9	2000–2022

### **2.3 Importing of Search Results into Individual Bibliographic Software, Documenting the Search, and the Deletion of Duplicates**

The search results from all databases (from Table 2, Scopus totaled 1459, and there were 152 from ScienceDirect) were imported into Endnote20, a bibliographic software. Researchers imported these results by selecting from the menu, “Import into duplicate library” to exclude duplicated articles. As a result, 162 out of the 1,611 articles were found to be duplicates and were removed from the software. Therefore, the remaining articles totaled 1,449.

### **2.4 Organization of Relevant and Irrelevant Articles**

Next, due to much keyword searching, the results of 1,449 articles as the first pass revealed that there were several broad topics not relevant to the aim and research question. Therefore, we set up a second pass to narrow down the number of articles. Researchers read all titles and abstracts and reviewed the complete articles to determine whether each met the criteria, aim, and research question by focusing on realted contents in the area of “creativity” in “art” or “design” or “photography” “class”. As a result, the total number of articles remaining after the second pass was 84, as presented in Table 2:

### **2.5 Searching for Additional Articles, Using Other Forms of Searching, Google Scholar**

However, due to the limited number of articles on photography topics, there were only nine articles from both databases. Due to the limited amount of information, researchers used Google Scholar as a gray area (not indexed in common databases but potentially related to the topic) and searched more articles to find information about creativity in photography classes from 2000 to the present from books, conferences, and journal papers. As a consequence, researchers searched the top 500 articles out of 20,000 hits from Google Scholar. After reading only summaries, the researchers selected 119 related articles. Next, after reading all abstracts in addition to the whole articles, researchers finally selected nine articles related to the topic of creative photography classes.

## **3. Research Gap by Keyword Co-Occurrence Analysis**

This review article focuses on three main keywords: creativity class, art or design, and photography. Researchers attempted to search the relationship between a pair of two keywords from Scopus and ScienceDirect using VOSviewer software to identify trends and relationships presented in Table 3 and Figure 1

Table 3 The top 10 keywords from a pair of two keywords

Creativity AND art or design		Creativity AND photography		Art or design AND photography	
Keywords	Occurrences	Keywords	Occurrences	Keywords	Occurrences
1. Creativity	714	1. Creativity	80	1. Photography	452
2. Innovation	104	2. Art	26	2. Art	100
3. Design	68	3. Photography	62	3. Photovoice	58
4. Art	55	4. Photovoice	19	4. Aesthetics	34
5. Higher education	51	5. Education	15	5. Photogrammetry	43
6. Design thinking	47	6. Identity	11	6. Education	42
7. Education	45	7. Collaboration	12	7. Contemporary art	39
8. Design education	40	8. Higher education	10	8. Design	33
9. Creative thinking	38	9. Children	10	9. Architecture	32
10. Critical thinking	30	10. Technology	8	10. Landscape	26

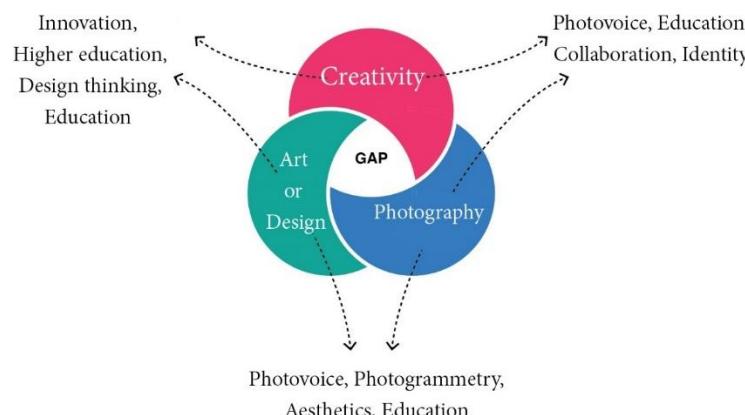


Figure 1 Research gap of this review article

Through the co-occurrence of all keywords to examine the research gap (Table 3 and Figure 2-4), we recognized that most keywords in the relationship between “creativity AND art or design” (not included main keywords were, e.g., creativity, art, and design) mostly concerned: Innovation (104), Higher education (51), Design thinking (47), Education (45), Design education (40), Creative thinking (38), and Critical thinking (30)

The link between “creativity AND photography” mostly concerned: Photovoice (19), Education (15), Collaboration (12), Identity (11), Higher education (10), Children (10), and Technology (8)

The link between “art or design AND photography” mostly concerned: Photovoice (58), Photogrammetry (43), Aesthetics (34), Education (42), Contemporary art (39), Architecture (32), Landscape (26).

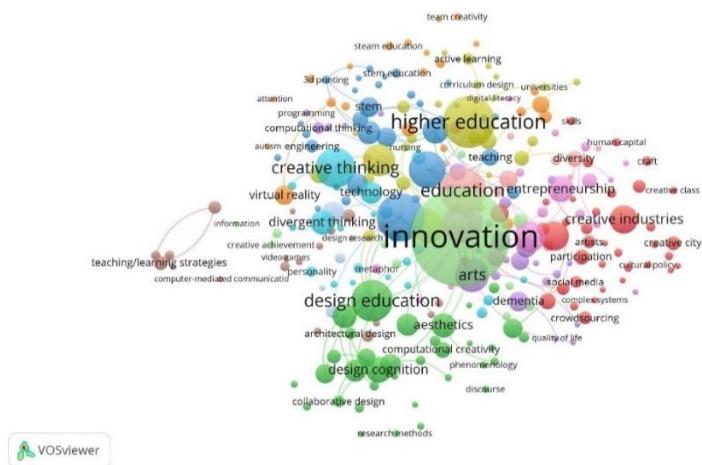


Figure 2 The keyword co-occurrence based on the keywords linking “creativity AND art or design”

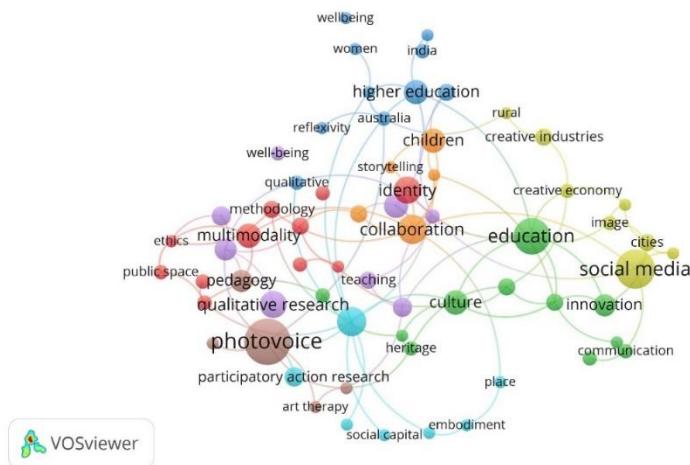
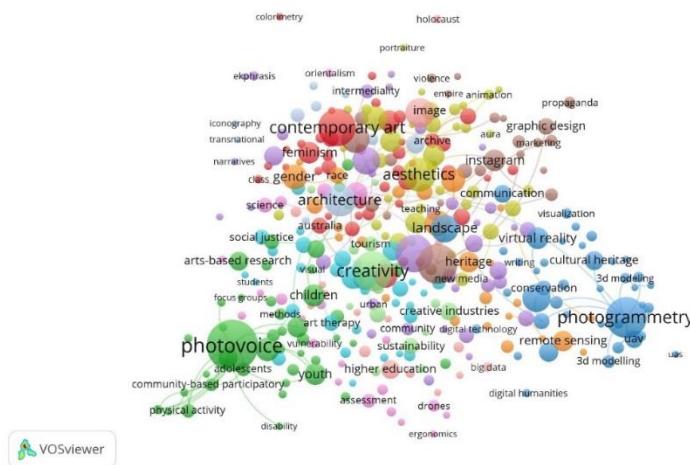


Figure 3 The keyword co-occurrence based on the keywords linking “creativity AND photography”



**Figure 4** The keyword co-occurrence based on the keywords linking “art or design AND photography”

#### 4. Content Analysis

All studies were examined using content analysis, which involves thematic coding conducted by grouping the meaning of the whole sentence or paragraph rather than the text (Ryan & Bernard, 2000). For the reliability test, results were rechecked and grouped by three researchers, who worked together to discuss the final coding. In short, there are four groups with 23 themes presented in Figure 5 as follows:

- Designing creative curriculums: 7 themes
- Constructing creative classrooms: 7 themes
- Creative teaching: 5 themes
- Students' characteristics: 4 themes

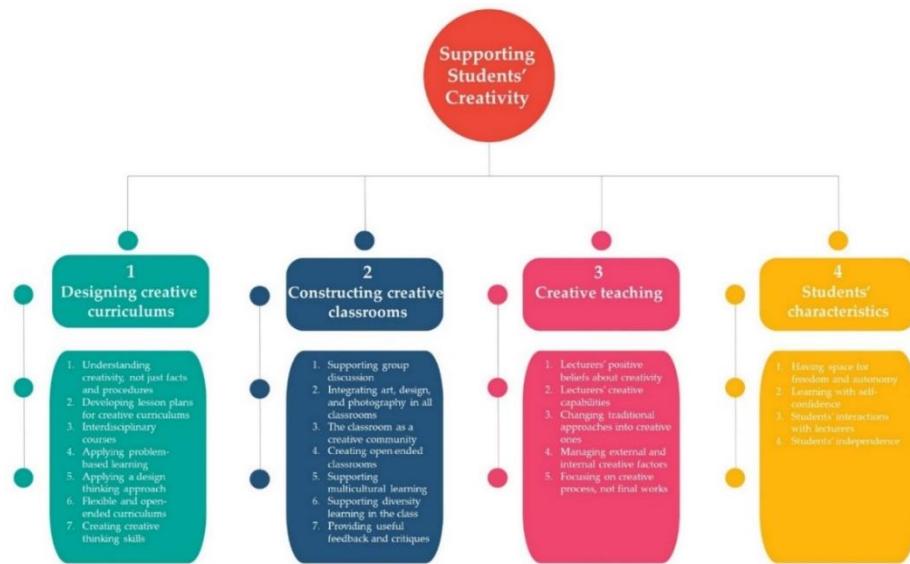


Figure 5 A diagram from content analysis presenting four groups with 23 themes

##### 4.1 Designing Creative Curriculums

###### *Theme 1: Understanding creativity, not just facts and procedures*

In the past, acquiring knowledge at universities meant collecting facts (statements) and procedures (step-by-step instruction) about how to solve problems. The goal of studying at schools or universities was to teach these facts and procedures. However, today's university students need to apply creativity to understanding new concepts, ideas, or knowledge. This is especially true for students in photography classes, who must apply artistic skill (e.g., composition, color theory, and art history) and technical skill (e.g., lighting, camera control, lens work, and calculations) to create their works with their original style (Licul, 2020).

###### *Theme 2: Developing lesson plans for creative curriculums*

Sawyer (2015) suggested that changing learning environments can foster creativity. For example, math or science classes should be redesigned to let students think creatively—to propose strong and creative research questions—rather than only demonstrating existing knowledge. Sawyer (2012) also

suggested that students should be provided with loose structures that they can improvise towards content knowledge, skill, and understanding.

#### *Theme 3: Interdisciplinary courses*

Chang et al. (2022) illustrated that, in order to construct creative art and design curriculums, educators must craft interdisciplinary courses offerings. Runco and Jaeger (2012) argued that such curriculums can help students improve teamwork, communication, and critical thinking skills since they require working with different perspectives to create innovative and effective solutions. Such curriculums combine students from different academic departments in classes together, so they actively share ideas to solve problems and present solutions creatively.

#### *Theme 4: Applying problem-based learning*

Problem-based Learning (PBL) is a pedagogy approach applying case studies or problems as starting points to accomplish the intended learning objectives (Birgili, 2015). This method is quite innovative and related to the concept of learning with creativity in classrooms. In fact, PBL has been applied in photography classes. Sullivan (2010) recommended that, in order to create photography works, students should first identify the problems and issues of the situation. For example, in documentary photography class, students should research and explore what they are taking photos of. Next, they must present different solutions to express their concepts and ideas to solve the queries, such as how photography works.

#### *Theme 5: Applying a design thinking approach*

The most famous method from PBL is the design thinking approach (Callahan, 2019; Von Thienen, Royalty & Meinel, 2017). Design thinking refers to problem-based methodology, which seeks creative and innovative ways of finding solutions and possibilities. Chang et al. (2022) recommended that the original concept of design thinking originated with Herbert Simon's *The Sciences of the Artificial*, divided into two parts: empathy (people from different fields exploring various issues differently) and ideate (finding and proposing the workable solutions to finally present the prototype).

#### *Theme 6: Flexible and open-ended curriculums*

Hall and Thomson (2017) and Sawyer (2017) explained that art and design curriculums are constructivist and involve student-centered rather than lecturer-centered approaches. Sometimes, assignments and curriculums are not set up in advance but develop along with the students' practice and creative skills. Several studies have pointed out that the relationship between design lecturers and students is "negotiated and improvisational" (Sawyer, 2017, p 106). Lastly, open-ended, improvised, and flexible-in-design curriculums can support and foster creative and higher-level learning outcomes (Nathan & Sawyer, 2014; Sawyer, 2017).

#### *Theme 7: Creating creative thinking skills*

Creative thinking is "the entire set of cognitive activities used by individuals according to a specific object, problem and condition, or a type of effort toward a particular event and the problem based on the capacity of the individuals" (Birgili 2015, p 2).

Walter, Baller and Kuntz (2012) suggested that assignments in photography classes be aimed at developing students' creative thinking skills. This is because, in taking photos, students develop social skills in interactions with other community members, leading them to understand different perspectives and

experience enhanced real-world experiences. Students must solve real problems in the assignments they face, such as technical limitations, and apply their existing knowledge to try to create something new in their projects; this is the process of creative thinking.

#### 4.2 Constructing Creative Classrooms

##### *Theme 1: Supporting group discussion*

Chan (2013) suggested that art and design lecturers should add group discussions into the classroom as they allow students to share their points of view and encourage them to think differently and more creatively. The key point is that sharing ideas in groups encourages students to learn from others with different ideas and to better understand how to group diverse concepts together, often engaging with ideas they may never have considered before.

##### *Theme 2: Integrating art, design, and photography in all classrooms*

Art, design, and photography classes are good examples of creative classrooms; students can present their concepts, ideas, and designs (Anderson, Katz-Buonincontro, Bousselot, Mattson, Beard, Land & Livie, 2022).

In the case of photography, some mathematics classes invite students to walk around the city and take photos of geometric aspects of architecture for the purpose of analyzing creative models and studying geometry (Rizzo, Laura, Manceñido, Lavicza & Houghton, 2019). Furthermore, Sharples, Davison, Thomas and Rudman (2003) used photography in mathematics classes to calculate the slope of rooftops. Rizzo et al. (2019) suggested that adding photography assignments to classes to build problem-solving skills could help students develop strong senses of their differences, strengthen communication skills, and develop authenticity, which all lead to creative thinking.

##### *Theme 3: The classroom as a creative community*

Sawyer (2017) recommended that in design classes, lecturers should set up the classroom as a community of practice, meaning creating a classroom environment that fosters creativity, and where lecturers and students are peers, instead of the more traditional style.

Photography classes should not only be about taking photos and getting grades but also about learning to communicate with each other. Pentzke, Suhajcik and Glynn (2021) recommended that lecturers should set up photography assignments and creative environments in the classroom to improve communication skills such as sharing and presenting photographic works and receiving feedback from other students. Furthermore, in the class, students should be encouraged to explain how they solved problems creatively and develop their methods for completing the assignment.

##### *Theme 4. Creating open-ended classrooms*

Adams and Forin (2016, p 61) suggested that art and design lecturers should act as if they are “walking a line between driving students in a particular direction and encouraging students to act independently”. Regarding this method, Sawyer (2017) stated that the majority of studies found that design lecturers in universities successfully avoided an authoritarian teaching style through fostering collaboration and avoiding being overly authoritative. For example, Salazar (2013) summarized that 90 percent of students preferred the open-ended curriculum. Orr, Yorke, and Blair (2014) stated that, after testing, most students rejected the traditional pedagogy, preferring to share ideas and knowledge with lecturers freely.

### *Theme 5: Supporting multicultural learning*

Sharif (2019) and Maddux, Yang, Falk, Adam, Adair, Endo, Carmon and Heine (2010) suggested that multicultural learning is a process related to creativity. This is because, when students acquire new information and ideas from different cultures, they have the opportunity to make connections between the new information, thus thinking more creatively. In photography, mixed or diverse cultural experiences are highly necessary. Brown (2005) supported that photography assignments in multicultural environments create discussion and increase understanding, creativity, and critical thinking. Students can learn from different cultures and understand differences between people from real-world experiences through their own and other students' work.

### *Theme 6: Supporting diversity learning in the class*

Diversity can be a mixture of differences between Western and Eastern cultures. For example, Morris and Leung (2010) mentioned that Western designers seem to focus on novelty over appropriateness, whereas Eastern designers emphasize appropriateness over novelty. In Eastern cultures, creativity refers to a dynamic and reuse or interpretation of tradition rather than breaking the tradition and creating the new one. This is contrasted with Western culture, where creativity means creating the new thing with is originally Morris and Leung (2010).

Regarding photography class instruction, Sharples et al. (2003) conducted research that mixed different age groups of 180 students in a photography class. The results indicated that more diverse groups of students resulted in more noticeable development of interpersonal, communication, and creative skills. This is because photography as a medium can build active relationships among students and their friends, parents, and family (as they take photos of them).

### *Theme 7: Providing useful feedback and critiques*

Most students in general education view assessments or feedback as unsafe, stressful, and competitive (Dannels, 2011). However, in art, design, or photography curriculums, Dannels (2011) argued that positive feedback is useful and can enhance student work. However, art and design lecturers should not critique students personally but, instead, help them to progress and better focus on the creative process. Webster (2006) and Sawyer (2017) also supported the idea that the majority of design students consider feedback from experts or lecturers as encouraging, stimulating, collaborative, and supportive.

## **4.3 Creative Teaching**

### *Theme 1: Lecturers' positive beliefs about creativity*

Teachers often experience conflict on the subject of creativity in the classroom since student creativity is quite personal, subjective, and difficult to evaluate (Anderson et al., 2022; Bereczki and Karpati, 2018; Katz-Buonincontro, Perignat, and Hass, 2020). Anderson et al. (2022) and Bereczki and Karpati (2018) recommended that, first, teachers must have a growth mindset about the creative potential in both themselves and their students; this is possible through emphasizing effort and process rather than talent and final output only.

Next, instructors should validate the creativity of students by encouraging them to share new ideas or opinions about all possibilities. Most importantly, they must have tolerance for ambiguity when experiencing uncertainty in the classroom.

*Theme 2: Lecturers' creative capabilities*

Anderson et al. (2022) and Orr and Kukner (2015) suggested that teachers should have the capability to be imaginative and ready to take risks and also be reflective and open minded about how to teach. In addition, they should have a sense of responsibility about being interested in a student's response or ideas and that they have minds open to any possibility. Anderson et al. (2022) emphasized that facing uncertainty confidently and tolerating the ambiguity of open-ended questions is the first step to having a creative class; students can think differently because they do not feel they are being controlled.

*Theme 3: Changing traditional approaches into creative ones*

Cho, Oh, Kwon, Kim, Chi and Hong (2011) and Harris (2016) suggested that, regarding the goal of creativity, lecturers should include activities that encourage diversification of teaching and learning together, such as design thinking, problem-solving skills, promoting a creative classroom environment, encouraging students to present their ideas, respecting unique ideas, and honoring the diversity of students.

In and of itself, photography is a creative approach, not a traditional one. Students must go outside to take photos (e.g., landscapes, travel, documentary photography) with new perspectives. This encourages photography students to interact more with nature and different cultures. Therefore, lecturers could create creative photography assignments related to social issues beyond the classroom. For example, assignments about sustainability could inspire students to research and understand social issues, nature, and the environment and the appropriate technical skills that would result in the desired outcome: creativity (Sipos, Battisti and Grimm, 2008).

*Theme 4: Managing external and internal creative factors*

Creative teaching is composed of external and internal factors (Meintjes & Grosser, 2010). Regarding external factors, the culture of the university or surrounding area can support or impede the creative teaching skills of lecturers. For example, managing a large number of classes could make it difficult for lecturers to have sufficient time to prepare creative activities (de Bruin & Harris, 2017; Wei, Chuang & Smith, 2022). Internal factors include the lecturer's characteristics and capabilities, such as their knowledge, personality, improvised skill, motivation, or beliefs (Foster, 2015).

*Theme 5: Focusing on creative process, not final works*

The process of being and acting creatively has been the primary goal of art, design, and photography education (Cornock, 1984; Dannels, 2011; Graham & Zwirn, 2010; Orr & Bloxham, 2012; Salazar, 2013; Sawyer, 2017). The creative process emphasizes the process of creation rather than the final result, especially when design students face problems or risks while working.

Through photography class, as a practice class Sanif, Hussin, Senom, Siraj and Putih (2013) supported the idea that teaching photography should emphasize the creative process from the initial concept to the final product. Photography is non-verbal communication; there is no text telling the story. Students must develop their own concepts and story to easily communicate to audiences. Thus, photography students must go through several creative processes such as understanding the issue,

developing the concept and symbolism, discussing with others, sketching, exploring the medium (e.g., camera, lens, photographic equipment), technical testing, shooting, and post-processing.

#### **4.4 Student Characteristics**

##### *Theme 1: Having space for freedom and autonomy*

Chan (2013) recommended that lecturers who are student-centered, who allow students to have space for freedom and autonomy, will have more creative classes than controlling lecturers. Freedom could let students generate rational ideas with creativity. However, freedom must be balanced with guidance. Students should be well-informed concerning their assignments and the lecturer's expectations. (Chan, 2013; Klunklin, Subpaiboongid, Keitlernapha, Viseskul & Turale, 2011).

Sullivan (2010) supported that photography students must be autonomous and choose their own concepts and sometimes topics according to their styles and interests. Therefore, lecturers should let them have freedom for thinking, processing, and finishing their photographic works.

##### *Theme 2: Learning with self-confidence*

Self-confidence is the first stage of generating creative ideas. Chan (2013) suggested that confidence plays an important role in students' willingness to present their ideas with creativity. Klunklin et al. (2011) supported the idea that students with high self-esteem are more likely to step out of their comfort zone or contribute creative ideas. Therefore, before supporting students in their creativity, lecturers should first build students' self-confidence by valuing their contributions, appreciating their efforts, and encouraging them to leave their comfort zones.

##### *Theme 3: Students' interactions with lecturers*

Design classes require students to develop their understanding of design implicitly, through practice works rather than through formal teaching and the study of theory (Taneri & Dogan, 2021; Van Dooren, Van Dorst, Asselbergs, Van Merriënboer & Boshuizen, 2019). Therefore, reflection, feedback, and interactions between lecturers and students are significant variables. Lecturers in design classes should be coaches, guiding students as they practice. In turn, design students must actively embrace challenges as they work independently, as due to the nature of design (learning by doing), students often practice their skills individually.

##### *Theme 4: Students' independence*

Students can learn more effectively by conducting experiments and taking risks (Graham & Zwirn, 2010). Graham and Zwirn (2010) also supported the idea that design lecturers should try to encourage students to make mistakes, take risks and engage in experiments. Moreover, students' works are quite different and autonomous. Therefore, the art and design lecturer should understand the difference between students' characteristics and support them.

### **5. Discussion: Applying these approaches into creative photography classes**

Overall, the issues to discuss are that “designing creative curriculum”, “construct creative classroom”, “creative teaching” and “students' characteristics”

In short, setting up a creative photography curriculum by focusing on sharing ideas, experiences, and information from lecturers and diverse groups of students, encouraging students' participation and improvisations, and open-endedness and flexibility in design curriculums are all the main components necessary to support creativity in photography students.

Photography class involves not only taking photos with technical skill but also communicating (presenting, sharing, and giving feedback) with others (Pentzke, Suhajcik & Glynn, 2021). Lecturers should not critique students' works in an overly critical way. They should encourage, support, and give them positive feedback.

Moreover, art/design and photography lecturers should focus on the creative process in the classroom as the primary goal rather than final works only (Sawyer 2017). This means that students should focus on how to create creative design work and link their concepts, storytelling, symbols, ideas, and the whole process.

Lastly, art, design, and photography classrooms should focus on practice works; this is different from the general classroom. Lecturers must understand students' independence and autonomy, and support them in practicing unique ideas to interact, discuss, and reflect on their lectures (Graham & Zwirn, 2010).

## 6. Summary

Using a systematic literature review, this article aimed to contribute understanding about how to support creativity in photography classes by reviewing, analyzing, synthesizing, and applying studies from art and design research, as presented from Sections 3 to 6. Moreover, this review article set up a research question: "What elements that help foster creativity in art and design classrooms could be applied to photography classes, and how?", which is illustrated in Figure 5. The researchers used the content analysis method to group and summarize the articles into four main categories with a total of 23 themes as follows:

1) Designing the creative curriculum — The objective is to design curriculums that do not just involve remembering facts and procedures but should focus on creative learning processes, artistic and technical skills, and students' individual styles. Additionally, interdisciplinary, flexible, and open-ended curriculums focusing on student-centered, design thinking methods and PBL should be added into creative photography curriculums.

2) Creating creative classrooms — In the photography classroom, lecturers should support students having group discussions by mixing different cultures in groups to be active, think differently, and work creatively. Lecturers should have a creative community, with both lecturers and students acting as peers to assist each other since photography class involves communicating (presenting, sharing, and giving feedback) with each other. Lastly, lecturers should encourage, support, and give students positive feedback.

3) Creative teaching — This is most significant element. Photography lecturers must have a growth mindset and open mind about creativity in both themselves and students and understand that students will be autonomous. Traditional teaching should be transformed into creative approaches by including

diverse creative methods such as design thinking, problem-solving skills, and encouraging a creative environment to freely share ideas. Photography lecturers should have creative assignments related to topics beyond technical photographic skills to encourage students' understanding of social issues, real-world situations, and different cultures. Lastly, lecturers should focus on the creative process in the classroom as the primary goal rather than final works only.

4) Students' characteristics — Photography students should build self-esteem or self-confidence, as the first and most significant step to having creativity is lecturers appreciating their work. Next, students should have space for freedom and autonomy. Lecturers must understand this and support students' practice of forming unique ideas and interacting, discussing, and reflecting on their lectures.

Finally, four main categories with 23 themes identified in this review could be applied into any other class, not just art, design, or photography. If the goal of studying in university is creativity, as the most significant skill in this age, this article, especially Figure 5, can serve as a review framework for teaching and learning in all subjects, as it covers all four categories from curriculum, classroom, teaching, and students.

However, a limitation of this article is the small amount of any discussion about creative or teaching photography class studies: only nine articles from Scopus and ScienceDirect and nine from Google Scholar. Moreover, the majority of them are not related directly to developing creative photography classes or teaching. Researchers therefore must apply factors and recommendations from art and design studies to create the review framework.

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