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Looking, Experimenting, Creating, Telling – Testing a Pedagogical Model for Design Learning

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Abstract

This article shares the outcomes of international workshops focused on traditional costume construction and surface embellishment techniques and designs. These workshops were inspired by the findings of the Creative Europe TRACtion (Traditional Costume Innovation) project. The latter motivated students and adult learners in the Republic of Ireland, Finland, and Malta to develop creative, sustainable, and innovative responses to traditional textile artefacts. The Finnish Association of Design Learning (SuoMu) Design Learning Model was applied to support the development of creative thinking in the workshops. Additionally, teaching strategies developed by textile educators and craftspeople in each context complemented the SuoMu Design Learning Model, facilitating interactions between workshop ideas, materials and participants. The workshops aimed to foster design, creative thinking, sustainability, innovation, and a deeper appreciation of textile heritage. Participant feedback was analysed through thematic data analysis, and the visual outcomes were examined for indicators of creative thinking, such as fluidity, flexibility, elaboration, and uniqueness. The SuoMu model played a key role in guiding the design process and developing creative thinking skills. Sketching and brainstorming techniques sparked a wealth of ideas, while group activities and practical and experiential learning supported the ideation process. The workshops led to numerous fluent and flexible responses and ideas, many of which evolved into unique and innovative designs. Participants developed visual literacy skills and textile cultural empathy while achieving sustainability in material usage.

Keywords

traditional costumes, intangible cultural heritage, textile education, design learning process, creative thinking

Introduction

Creativity is culturally defined (Sawyer & Henriksen, 2023), and because culture is continuously re-created by people (Van zanten, 2004), various conceptions of creativity exist. Many creative products are “collaborative, group creations” (Sawyer & Henriksen, 2023, p. 245) and traditional craft outcomes provide valuable information about cultural practices. This study was underpinned by the need to build awareness, especially among younger generations, of the importance of our textile cultural heritage and the need to safeguard it (UNESCO, 2003). We

wanted to bring to light tacit knowledge and skills relating to traditional textile costume artefacts in three contexts. To that end, textile costume artefacts from the 19th and 20th centuries were selected for analysis by the Creative Europe TRACtion project research team (Portelli et al., 2024) in the Republic of Ireland (RoI), Finland and Malta (Figure 1).

Embroidery and lace designs used in Irish costumes constructed during the early 1900s were analysed for the TRACtion study. Four costumes were selected (Figure 1, Row 1) and included: 1) a wedding gown with Irish crochet lace and whitework embroidery (Images 1 and 5); 2) a whitework child's dress and cape (Images 2 and 6); 3) a skirt with Irish crochet and Mountmellick whitework embroidery (Images 3 and 7); and 4) a Carrickmacross appliqué lace skirt (Images 4 and 8). Irish crochet was commonly used as a trim or insert feature in clothing. Mountmellick embroidery, originating in County Laois, is a distinctive Irish whitework embroidery due to its implementation on a larger scale, floral designs and the contrast between matt background fabric and shiny mercerised cotton stitching (Stanton & Scott, 2009). Italian lace designs and techniques influenced lace production in Carrickmacross, County Monaghan, owing to the travels of an Anglo-Irish philanthropist, Mrs Grey Porter, who recognised the value of lace in providing a family income in rural areas. She acquired Italian lace samples for analysis and supported the education of lacemakers who adapted many designs by including traditional symbols (O'Neill, 2023).

Traditional folk costumes in Finland refer to traditional festive and everyday clothes worn by the peasant population in the 18th and 19th centuries (Valkeapää, 2023). The Finnish component of the study focused on native Äyrämöinen women's folk costumes originating from Koivisto and Heinjoki in the Karelia Isthmus (Figure 1, Row 2). The Isthmus, which previously belonged to Finland until the Second World War, is located between the Gulf of Finland and Lake Ladoga and is now a part of northwestern Russia. Owing to multiple conflicts, the Karelia region was isolated from European cultural life, and consequently, its costumes remained traditional until the beginning of the 20th century (Hollmén, 2009). The clothes were skilfully made, and much effort was invested in decoration. The embroideries that stood out from the generally simple clothing were the defining characteristic of the vibrantly coloured Äyrämöinen costumes. Numerous hand-woven and braided colourful ribbons were used in the costumes for various functions, including belts, headgear, sock ribbons, and clothing fasteners.

The Għonnella (Figure 1, Row 3), a traditional Maltese costume, was analysed owing to its unique form and construction processes. The voluminous, cape-like garment was draped over the head by the wearer. It was constructed from cotton, corded silk, or linen (Azzopardi, 2022) and reinforced with materials such as cardboard and whalebone to provide structure and flexibility, which were essential characteristics of this garment (Portelli et al., 2024). The design evolved owing to social and cultural influences while maintaining its significance as an emblem of Maltese heritage. Its use gradually declined, disappearing almost entirely by the 1970s and ultimately by the end of the 20th century (Azzopardi, 2022).

Following the selection of costumes in each context, the costumes' structural and technical construction processes, including fabric manipulation and embellishment techniques, were scientifically analysed and represented using two and three-dimensional methodologies. The traditional costume analyses informed the design of a series of innovative face-to-face

workshops for adults and young learners in Ireland, Finland, and Malta, as well as online workshops for a broader international audience.

Figure 1. Selected TRACtion traditional costume artefacts (Top - RoI: Private collection photographed by Kathryn McSweeney & Donal Hackett; Middle - Finnish Koivsto and Heinjoki costumes (Museum artefacts (South Karelian Museum, Lappeenranta) photographed by Riikka Räisänen); Bottom - The Għonnella – the Maltese costume (Photos (1-3) courtesy of the National Archives of Malta photographic collection, images 4 – 7, photographed by Lorraine Portelli).

In addition to developing an appreciation of textile cultural heritage using traditional costume artefacts, the TRACtion project granting body (Creative Europe) stipulated a focus on sustainability. A critical goal of the project was to promote sustainable textile production approaches and thinking, including considering the processes and resources required to make clothing. Another TRACtion project requirement was the development of creativity and innovation. In Ireland, Finland, Malta, and other contexts, there is a movement in education away from routine knowledge (Sahlberg, 2011), routine skills (OECD, 2024b) and cumulative knowledge and learning (Konst & Kairisto-Mertanen, 2020; Vincent-Lancin et al., 2019) toward the facilitation of learning situations that foster broader and deeper learning (Fullan et al., 2018; Koli, 2017). Contemporary primary and post-primary educational frameworks in Ireland, Finland, and Malta identify creativity as a key skill and competency and include it in learning outcomes (DES, 2015; Finnish National Board of Education, 2016; MATSEC, 2024; Ministry of Education and Employment, 2012; NCCA, 2023a, 2023b, 2024). In alignment with current educational trends in the above contexts, the project team designed learning experiences that had the potential to foster an appreciation of textile cultural heritage, sustainability values and creative thinking.

Literature Review

Cultural heritage and sustainability

Traditional craft outcomes provide valuable information about cultural practices. These practices, including expressions, knowledge, and skills, are often recognised as part of a cultural legacy by communities, groups, and sometimes individuals and are recognised by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as intangible cultural heritage (UNESCO, 2003). Textile culture is an integral part of people's way of life. UNESCO's recognition of cultural sustainability as a dimension of sustainability (UNESCO, 2019) has generated a greater awareness of the importance of intangible cultural heritage and action towards its safeguarding. In addition to promoting cultural sustainability, this project incorporated sustainable production processes. We aligned with Treggiden's view (2020, p. 119) that "sustainability is not the main driver of our creativity, but it has definitely become a factor in our design process." The traditional costume artefacts selected for the study were "slowly made, mended by hand and cherished for generations (Treggiden, 2020, p. 114)." Through exposure to costume artefacts and their inherent qualities and techniques, we aspired to develop an appreciation for their utilitarian and aesthetic value, illustrate and promote the skills used in their production, and consequently counteract disposable trends and a "throwaway culture" (Fletcher, 2016). We used textile artefacts to generate "emotive orientations", as the works were "experientially and emotively real" (Pallasmaa, 2015, p. 9), as well as innovative and creative responses.

Creative thinking

The Organisation for Economic Co-operation and Development (OECD) define creative thinking as producing diverse and original ideas and evaluating and improving others' ideas (OECD, 2024a). The ability to engage productively in generating, evaluating and improving ideas "can result in original and effective solutions, advances in knowledge and impactful expressions of imagination" (OECD, 2024b, p. 42). Creative thinking skills use divergent thinking and involve cognitive processes such as generating and integrating ideas and seeing things in new ways (Johnson, 2010). It is widely recognised as a 21st century key skill (Dufva & Rekola, 2023; OECD, 2024a; World Economic Forum, 2023), a higher-order cognitive thinking skill (Anderson et al., 2001; Bloom, 1984; OECD, 2024b) and a global competence (Fullan et al., 2018). In 2022, the OECD Program for International Student Assessment (PISA) measured 15-year old students' creative thinking abilities for the first time, illustrating the value placed on creative thinking in today's world, one that requires new methods and perspectives to tackle emerging challenges (OECD, 2024a) and wicked problems (Thuan & Antunes, 2024). Additionally, digitalisation and artificial intelligence advances provide evidence of the importance of developing innovation, creativity and critical thinking skills over routine skills (OECD, 2024b).

Vincent-Lancin et al. (2019, p. 27) explain that creative thinking in an educational context can foster a profound understanding of "knowledge and solutions, and thus deeper learning." Positively, creative thinking can promote learning and engagement, deepen a student's absorption in their learning, activate higher-order cognitive skills and stimulate emotional development, resilience and well-being (OECD, 2024b). Similarly, Ireland's National Council for Curriculum and Assessment (NCCA) (NCCA 2023a, p. 9) states that "unlocking and promoting children's creative potential" positively impacts motivation and self-esteem.

Much creativity research has focused on the cognitive processes involved when creating. The literature distinguishes two types: big-C and small-C. The former relates to breakthroughs or masterpieces, and the latter refers to "everyday creativity" (OECD, 2024b, p. 143). Divergent thinking elements are often attributed to JP Guildford and EP Torrance from the 1960s. Torrance (2008) distinguished four creative thinking skills: fluency, flexibility, originality, and elaboration and these measures are frequently used when assessing creative behaviour in ideation tasks (Arefi & Jalali, 2016; Handayani et al., 2021; Johnson, 2010; Runco et al., 2010; Salemi, 2010; Trisnayanti et al., 2020). Fluency can be defined as the ability to produce as many ideas as possible without evaluating them (Johnson, 2010). Flexibility involves generating varied ideas, changing "the course of a person's thoughts", changing the "viewing angle" (Trisnayanti et al., 2020, p. 3), or creating a variety of different approaches (Johnson, 2010). Originality is developing new, unusual, or unique ideas (Johnson, 2010). Finally, elaboration is the development of "ideas along with details" (Handayani et al., 2021, p. 3) and the ability to add detail and expand ideas or embellish an original idea (Johnson, 2010). Trisnayanti et al. (2020, p. 3) equate elaboration with making the idea "richer, more exciting, or more complete."

The creative process is multi-faceted. Resources needed to support the creative process include domain-specific knowledge and skills, creative thinking processes, task motivation and a supportive environment (OECD, 2024b). Similarly, Kim (2017) identifies three features of innovation: cultivating creative climates, nurturing creative attitudes and applying creative thinking skills. Creative climate includes the educational and family environment, creative attitudes relate to talent, interests and personality, and the application of creative thinking skills is linked with the ideation process.

Developing creative thinking

The OECD PISA study conducted in 2022 (OECD, 2024b) looked at students' creative thinking performance and attitudes, as well as school leader and teacher attitudes towards creative thinking, and they provided a commentary on opportunities for student engagement with creative thinking. Only 50% of students believed they could change their creativity which is surprising as the OECD argues that all students have the potential to demonstrate creative thinking (OECD, 2024b, p. 38) and that "creative thinking skills can be taught" (OECD, 2024b, p. 5) – "developed through practice and honed through education" (OECD, 2024b, p. 143). The World Economic Forum (2023) recommends providing opportunities to create and innovate and freedom to make choices, developing a growth mindset, allowing time to focus, providing appropriate challenges, guiding discovery and fostering reflective reasoning and analysis. Developing creative thinking in the classroom using textile artefacts as a source of inspiration was a key focus of our study. We were curious to learn more about effective teaching approaches, models and strategies that support the development of creative thinking. To that end, the following subsection presents teachers' key role in unlocking creativity, Johnson's Thinking Frame for Creative Thinking Skills (2010), the OECD Centre for Educational Research and Innovation (CERI) project rubric (Vincent-Lancin et al., 2019) and the SuoMu (Finnish Association for Design Learning, 2023) Design Learning Model.

In the recent PISA study (OECD, 2024b), schools faring well in creative thinking value creativity. Teachers encourage original answers and support the expression of ideas in classes. Teachers have a key role in unlocking creativity, which can be achieved by encouraging exploration, generation and reflection upon ideas (OECD, 2024b). Supporting intuition, animating

imagination, revealing possibilities, broadening perspectives and generating unexpected ideas can support the development of creative thinking (Johnson, 2011). The qualities associated with the creative process can be developed using different frameworks and well-established pedagogical and design learning models.

Johnson (2010) developed a thinking frame for creative thinking skills. The framework identifies seven creative thinking skills and 'frames' or ideas to support the design of classroom teaching. The framework illustrated in Table 1 includes cognitive processes such as generating and integrating ideas and seeing things in new ways. The frame shows specific steps that can be used to support the development of the creative thought process.

Table 1. Thinking Frame for Creative Thinking Skills (CTS), adapted from Johnson (2010)

CTS	Definition	Thinking Frame
Fluency	Generate as many ideas as possible without evaluating them.	Look at the idea or problem. Do not worry about good or bad ideas. Add as many ideas as quickly as you can.
Flexibility	Create a variety of different approaches.	Look at the original. Find other ways for it to be used, solved, or applied.
Elaboration	Embellish an original idea.	Look at the idea. Add things to it to make it better or more interesting.
Originality	Create new ideas that are unusual or unique.	Find an idea or problem. Think of solutions or applications that nobody else has thought of before.
Integrate	Connect, combine, or synthesise two or more things to form a new whole.	Look at all things. Select interesting or important parts from each. Combine to describe a new whole.
Brainstorming web	Create a web to generate ideas relative to a given topic.	Look at the original ideas. Analyse to identify 2 – 5 related ideas for subheadings. Brainstorm to generate ideas for each subheading. Describe.
Generating relationships	The student will try to find related items or events.	Look at the item or event. Generate attributes. Find items or events with similar or related attributes. Describe the relationship.

Another interesting approach, developed by the OECD CERI project team to support creative and critical thinking in teaching and learning, was a rubric for teaching and learning with four categories (Table 2). The four creativity categories include inquiring, imagining, doing and reflecting. The rubric is intended to support educators in their identification of student skills related to creativity that can be nurtured by educators in teaching and learning rather than

assessment. Creativity aspects presented in Table 2 can occur at different points in the learning process and may not happen in a definite order.

Table 2. OECD Creative Thinking Rubric, adapted from the OECD CERI report (Vincent-Lancin et al., 2019)

Categories	Creative Thinking Rubric
Inquiring	Feel, empathise, observe, describe relevant experiences, knowledge and information. Make connections to other concepts and ideas, and integrate other disciplinary perspectives.
Imagining	Explore, seek and generate ideas. Stretch and play with unusual, risky or radical ideas.
Doing	Produce, perform, envision, prototype a product, a solution or a performance in a personally novel way.
Reflecting	Reflect and assess the novelty of the chosen solution and of its possible consequences. Reflect and assess the relevance of the chosen solution and of its possible consequences.

Based on initial research with teachers using the rubric provided in Table 2, the OECD CERI project team developed more comprehensive design criteria for developing pedagogical activities underpinned by learning science and formative assessment principles (Vincent-Lancin et al., 2019). Sample criteria include creating students' need and interest to learn, offering challenges, supporting the acquisition and practice of content and procedural or technical knowledge, developing a product to make the learning visible, addressing problems that have several possible solutions and using many techniques to solve them, leaving room for the unexpected and including space and time for students to reflect and give/receive feedback (Vincent-Lancin et al., 2019, p. 31). The frameworks and rubrics presented thus far provide a reference point for educators when planning lessons.

One design learning model suited to developing creative thinking skills is the Finnish Design Learning Association (SuoMu) pedagogical model. The pedagogy gives students the tools to think, ideate, and create solutions, supporting the development of knowledge and skills. Experiential learning and learning by doing are used. Learners and teachers are encouraged to experiment, take initiative, exchange perspectives, and share their ideas. The process can nurture independence and courageous thinking, idea exchange, and using mistakes (Finnish Association for Design Learning, 2023). The design learning pedagogical model comprises four steps: Look, Experiment, Create, and Tell (Figure 2). According to Rönkkö et al. (2016, pp. 49-50), the Design Learning Process is holistic, as responsibility for ideation lies with the craft maker rather than "following someone else's plan and adapting a ready-made design." The holistic craft process involves brainstorming to generate ideas and designs, research, experimentation, problem-solving and reflection.

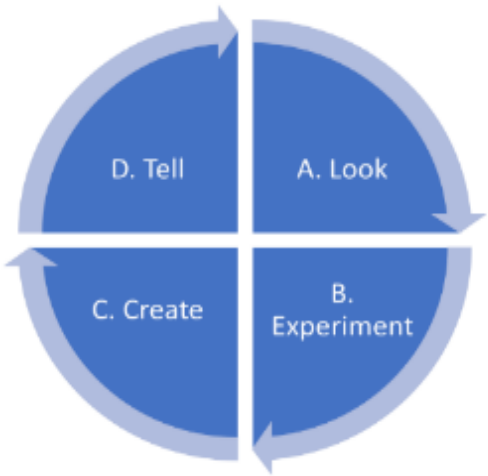

Figure 2. Design Learning Process, an adaptation of the SuoMu Finnish Association of Design Learning Model (Finnish Association of Design Learning, 2023)

The literature review informed our research design approach, providing insight into the creative thinking process, teachers' key role in unlocking creativity, and frames and models to support creative thinking development. The following section outlines the workshop design approach.

Methodology

The systematic steps of our qualitative study are illustrated in Figure 3.

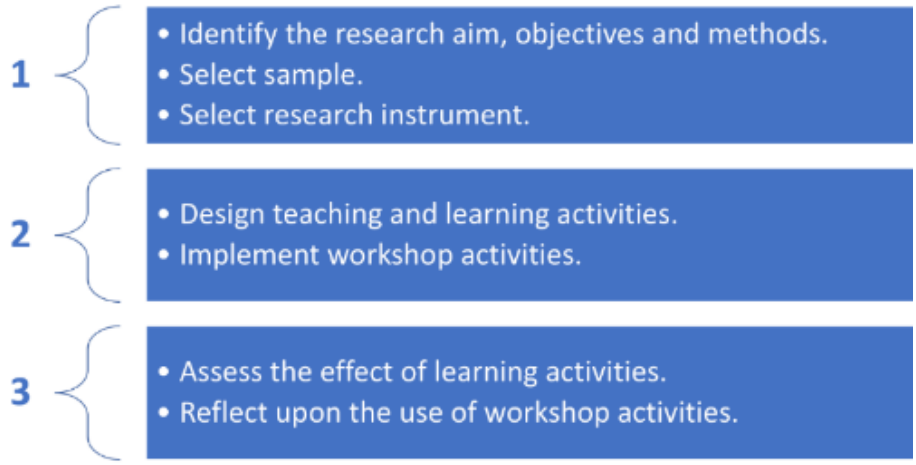

Figure 3. Systematic research steps

Step 1

Research aim, objectives and methods

The project aimed to develop an appreciation for traditional textile artefacts and heritage, support creative thinking development and facilitate sustainable and innovative responses to traditional designs and motifs.

Sample

The sample included young and adult learners from post-primary and initial teacher education and tertiary sectors in the RoI, Finland, and Malta. We used a purposive convenience sampling

approach. Students studying textiles and adults interested in textiles were invited to participate in the research study. See Table 3 for a further breakdown of the sample in each context.

Table 3. Sample Composition

Context	Number	Sample Breakdown
RoI	33	Adult learners, including National Learning Network learners (n=12) (back to work upskilling context) and adult learners (n=21), including young adults, textile enthusiasts, university craft education alums, artists, and textile artists
Finland	48	Craft education pre-service teachers (university level)
Malta	46	Teachers (n=10), pre-service teachers and university students (n=20), secondary school students (n=16)
Online	76	Members of the general public, including participants from the face-to-face workshops

Instrument

We focused on developing creative thinking using workshop strategies and illuminating creative behaviour in ideation tasks. Creative behaviour in workshop ideation tasks was informed by Torrance's four measures of divergent thinking framework (Torrance, 2008) and Johnson's (2010) thinking frame for creative thinking skills (Figure 4). The creative thinking measures include fluency, flexibility, originality and elaboration.

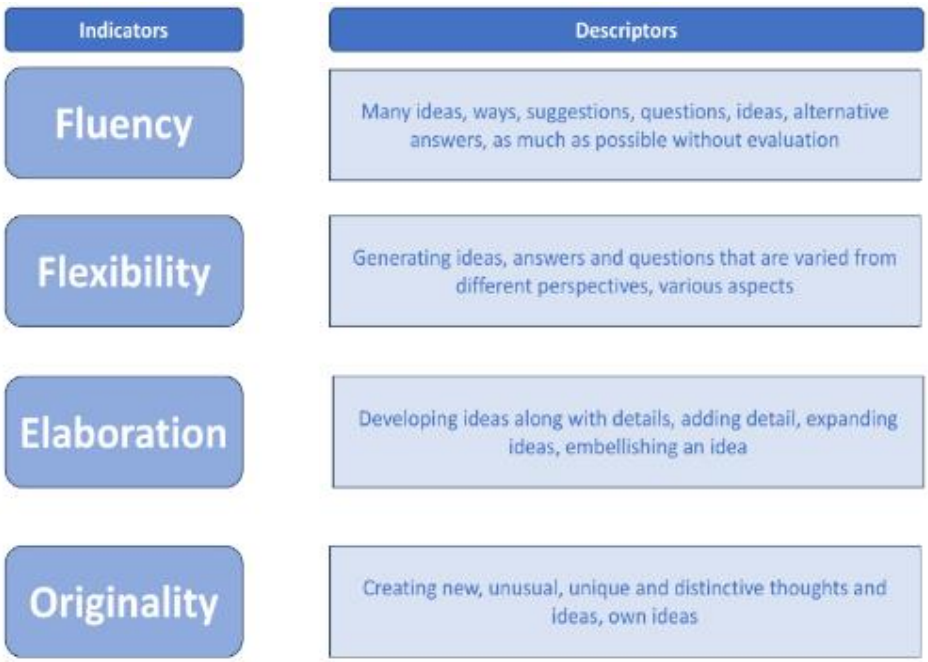

Figure 4. Measurement points for creative thinking indicators, adapted from the work of Torrance (Torrance, 2008) and Johnson (2010)

Step 2

Teaching and learning activities

The workshop instructors used the SuoMu (Finnish Association for Design Learning, 2023) Design Learning Model (Figure 2) when planning learning activities. The first stage, 'Look, ' involved a brainstorming strategy to quickly generate a bounty of ideas based on materials they got acquainted with. In the RoI, participants engaged in a sketching challenge involving selecting a costume design and drawing for three minutes. They used mixed media when drawing and worked on paper and fabric. Using mark-making and words, they individually documented their observations, emotions, and ideas. The participants proceeded to another design, repeated the task and shared their sketches with the group. Following the presentation of sketches, participants individually recorded any new ideas that occurred to them. They developed responses without censorship or evaluation. Essentially, we provided an alone-together-alone structure to support interaction between ideas and group synergies and to allow for independent solo work and ideation. Workshop participants in Finland used the brainstorming strategy to generate ideas, variations and possible solutions for hand-dyed tablet-woven belts and jewellery. Karelian folk costumes and jewellery served as a source of inspiration during the 'looking' stage. Ideation was upgraded to the next level using brainstorming. Similarly, Maltese participants used the brainstorming strategy to generate ideas for contemporary Għonella designs.

Following the brainstorming phase, participants experimented and created (Steps 2 and 3). The ideas generated from the brainstorming activity were classified to find the best ones for further development. Participants were free to respond in any direction, using various media, and abundant resources and materials were available, including fabric scraps (RoI and Malta), wool remnants and natural dyeing materials (Finland), to promote sustainable design responses. The workshop facilitators asked questions to support the design process. Finally, Step 4, 'Tell', involved participants showcasing advanced ideas using mood boards, sketches, and prototypes. After the workshops, participants had time to work on their designs, which resulted in numerous artistic creations in each context. Exhibitions were held in each county from May to August 2024 in addition to a combined virtual reality exhibition (https://tractionproject.eu/news/traction-joint-digital-exhibition/).

Practical, experiential learning

In the RoI, workshops focused on volume, specifically textile tucks and gathers, design ideation and development, including costume stitched responses, patterning inspired by costume motifs, media explorations and linkages, and experimentation with mixed media. Finnish craft workshops focused on traditional Finnish and Karelian textiles, colours and colouration techniques. Follow-on workshops focused on contemporary ideation and accessory prototyping. Similar to the RoI, in Malta, workshops focused on volume and the use of gathers to create different forms and structures. In each context, a guided teaching approach and brainstorming strategy were employed to encourage the development of fluent, flexible, elaborate and original ideas.

Implementation

20 hours of workshop activity were completed in Ireland, 27 hours in Finland, and 4 hours in Malta. The project team implemented two online workshops totalling 3 hours. 54 hours of direct workshop input were delivered during the project. Learners in the RoI used mixed media

when developing design ideas and prototyping. They created patterns, costume embroidery samples, and lace using crochet, tatting, and free-machine embroidery techniques and recorded their processes and ideas as they evolved during the workshop. They also presented workshop notebooks, prototypes, textile art, and mixed-media installation pieces. Finnish workshop outputs included sketches, drawings, photo collages, mood boards, portfolios, prototype artefact samples, finished products, jewellery, and dyed and woven belts. Using portfolios, participants explained their design and production processes with pictures, photographs, and text and documented everything from inspiration and ideation to the final finished output. Ideation steps were illustrated with photos that inspired the work. The participants illustrated different stages, variations and iterations in the design development and how the plan was concretised into the final craft product. Additionally, participants reflected upon their learning during the process and at the end. Maltese teaching plans provided contextual and technical content, visual imagery, digital resources, costume artefacts, and interactive opportunities where participants experimented, prototyped, reflected, created, and evaluated.

Step 3

Assess the effect of learning activities

We employed a qualitative thematic analysis approach (Braun & Clarke, 2022) involving a detailed description of textual workshop feedback and oral recordings. Workshop outputs, including design drawings, notebook pages, prototypes, and products, were analysed using a descriptive thematic visual analysis approach (Literat, 2013), which focused on describing the indicators of creative thinking (Handayani et al., 2021; Johnson, 2010; Torrance, 2008). The analysis of drawn images complemented with a discussion of the drawings is a non-mechanical visual research method (Coyne et al., 2021; Literat, 2013) suited to various cultural contexts. The method can potentially reveal "a more nuanced depiction of concepts, emotions, and information in an expressive, empowering, and personally relevant manner" (Literat, 2013, p. 84).

Conclusion

Reflect upon the use of workshop activities

The project team considered the use of learning activities to support creative thinking. We noted the learning gained from using the design learning model, practical and experiential learning tasks, sketching and brainstorming strategies.

Results

Workshop outcomes

We gathered oral (pseudonymised) and anonymised written feedback from the workshop participants (RoI (n=19), Finland (n=16), Malta (n=20)). The process was designed to be voluntary, which meant that feedback was not received from every participant.

Effectiveness of the teaching and learning strategies

The brainstorming and sketching activities created energy and anticipation among the participants. The experience was articulated by Aisling (RoI) as follows:

> *"The idea of having structure and surrender is what I feel is happening here today. Surrender – enjoying the whole atmosphere – this beautiful history and fine work*

> *combined with five minutes – voom, voom, voom- so we didn't get stuck. I find it so joyous."*

The participants enjoyed the "freedom of expression" (RoI, Participant (P) 1, P16), "learning techniques freely" using an experimental process (RoI, P7), having the "freedom to play" (RoI, P8) in an interactive (Malta (M), P2, P19) and positive learning environment (RoI, P15). The participants welcomed the "hands-on part" (M, P8), "hands-on activities" (M, P12) and "the practical aspects" (M, P14, P18), including "designing and sewing" (M, P14), "the making of the mini Għonella model" (M, P17, P16) and "learning by doing" (Finland (F), P8).

> *"The hands-on approach and learning through doing were synergistic. Casual discussions, insights, and thought processes that followed were fruitful and valuable for me." (F, P10)*

The alone-together-alone brainstorming approach was effective. One respondent commented that she enjoyed the "collaboration with others to form new ideas" (RoI, P7).

The participants welcomed the "opportunity to learn different things and ways of doing things" (RoI, P2), using mixed media and freely available resources to support their work in different directions. An environmentally conscious approach was evident in many responses. For example, "recycling materials represents sustainability to me, which is an important value (F, P15)." One participant spoke about repurposing materials that are "no longer used … giving them a new life as I no longer found them visually appealing in their previous form (F, P15)." Another participant noted the environmental issues surrounding using metal mordants when dyeing fabric and the need to look "for ways to use organic substances for mordanting that would be less harmful" (F, P2). The economic value of dyeing with natural materials and without "large quantities of chemicals" (F, P4) was mooted. "Finding ways to replace synthetic dyes with environmentally conscious alternatives" was a key takeaway from the Finnish workshops (F, P4).

The participants welcomed the group approach, which was a "social process" as "ideas and skills were shared and developed together (F, P14)." They enjoyed "bouncing ideas off each other" (RoI, P10), which supported the ideation process (RoI, P13, P14, P15) and produced a variety of "rich and diverse" outcomes (F, P10). "The shared ideas have inspired us to continue experimenting with different techniques" (M, P3) and "viewing the work of others supported the ideation process (M, P1)."

> *"We learned from each other. We shared various emotions- challenges, successes, and techniques and observed each other's experiments." (F, P15)*

> *"Since I didn't have time to try everything myself, observing the work and processes of others made the course content more diverse." (F, P16)*

Overall, it is evident that the group workshops were enriching and enlightening (M, P2), and the group process was social, interactive and productive.

The experimental process was especially evident in Finnish responses. They were noticing and making decisions about the next direction to take (F, P2). Skills were acquired through "trial and

error" (F, P2, P16), and actions were taken based on developing procedural knowledge. For example, different yarns were used to produce different colour effects, and the decision to use -materials was "intentional" and informed by knowledge of how the "materials absorb the colour differently (F, P2)." Three further examples (F, P8, P15, P16) evidence students' "learning by doing":

> *"Early in this course, the very pale beige tones taught me to study plants more carefully and get to know their properties." (F, P8)*

> *"I didn't set out to create any specific form but rather let the process guide me, and I am pleased with the results." (F, P15)*

> *"The process of making the jewellery was quite organic, as I was guided more by trial and error than by following a precise plan." (F, P16)*

Part of the experimental process involves problem-solving and overcoming challenges. One Finnish participant illustrates her learning as follows:

> *"I feel that trying and failing were key parts of my learning process. By continuing to experiment, I started finding plants in nature that could produce colour." (F, P5)*

Participants reflected upon mistakes occurring during the prototyping and production stages. One Finnish participant observed that "making a tablet weaving band requires a calm space and concentration, especially if you're creating a pattern" (F, P1). The participants reflected deeply upon their processes. One Finnish participant (F, P1) felt that the final result was "a bit restless. The shades are beautiful but didn't create the clearer stripes I hoped for." Another response illustrates the participants' engagement in dialogical reflection:

> *"I also had a small test sample of wool yarn in the same dye baths, with which I conducted an experiment. I wondered what would happen if I neutralised the oxalic acid from the rhubarb with baking soda as a base." (F, P2)*

Additionally, elements of critical reflection were evident:

> *"I remember a statement I read suggesting that artisans who "talk" with their materials do not necessarily separate thinking from making but rather create through a collaboration of hands and mind (Atkas, 2018). I found myself identifying with that idea. My design process is childlike and playful. There is spontaneous enthusiasm for making and experimenting, but there is always a vision behind it about the theme I'm exploring and where I am heading." (F, P12)*

The students commented on new learning and "surprises" (F, P1), and their enjoyment of the experimental process was palpable.

> *"There is a primal, almost magical aspect to plant dyeing, seeing the colour change as it dries." (F, P4)*

> *"The enthusiasm for exploring plants and walking attentively in nature that the course fostered was refreshing. Dyeing with natural dyes in schools could also spark interest in nature." (F, P8)*

Another Finnish pre-service teacher had similar ideas for classroom teaching. She developed a worksheet for a group of young learners "to guide them, where they could colour in their hypothesis about the expected colour of the fabric and compare it to the actual results (F, P5)." One pre-service teacher alluded to her frustration with her "lack of skill" or level of procedural knowledge about dyeing and noted that she would keep the experience in mind when, as a teacher, "encountering students who are uninterested or unmotivated by certain [craft] techniques (F, P10)." Finally, participants' confidence in their creativity grew during the workshops. For example:

> *"Creating was easier for me than I had thought." (RoI, P1)*

> *"I am not afraid to try things out." (RoI, P11)*

> *"I was much freer in my creative process. Usually, I overthink and stress, but in the workshops, I just did it." (RoI, P19)*

> *"The phrase "just start" was so empowering. There was no pressure to produce anything in particular." (RoI, P9)*

> *"We were free to do what we wanted" (M, P15) … "allowed one to be creative." (M, P20)*

Textile cultural heritage appreciation

All participants were inspired by the costumes, their history and the different styles. Many participants (RoI) remarked on the value of costumes in revealing a story such as "the use of needlework as a means to freedom- a ticket to America for a woman in Ireland (Aisling, RoI)." For many Maltese participants, learning about the Għonella costume, its cultural and historical context (M, P13), and its construction was "new" (M, P9). Additionally, nature as a common source of inspiration was noted as a "really beautiful line of thread from them to us (Silvana, RoI)." The majority of participants noticed the natural and environmental design connections:

> *"I noticed how informed these women [craftspeople] were by the landscape around them, which we still share today. This piece [wedding dress] – the back of the dress and the threading through here, and the fine squares are like cells (Figure 5). For me, the spaces here are like the fields of the Irish landscape, and the hedges create the cells that make up nature – all the boxes you see between the threads. Everything they experienced [in the past] we still experience today. I could see it in the work; what the women saw back then, such beauty that we encounter daily, is recorded on the cloth. They told us their story through the cloth. It is just so exciting and beautiful that you can immerse yourself in that today." (Silvana, RoI)*

> *"Upon inspection of the traditional lace, we learned that the creators used inspiration from all around them in their work and often worked in groups like this." (Saoirse, RoI)*

"These pieces often feature strong themes of nature, which led me to further observe plants and natural forms during walks outside." (F, P15)

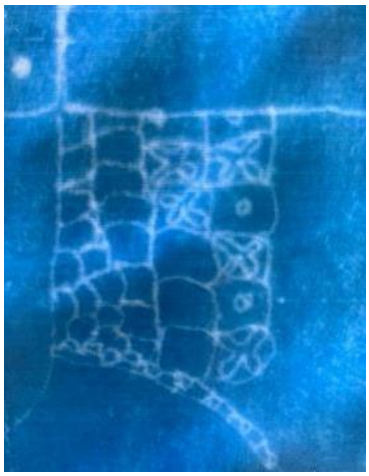

Figure 5. Lace Cells by Silvana Zec (RoI), Cyanoprint inspired by Irish lace

The participants alluded to looking at and exploring the designs and lacework in a new way (RoI, P4, P9). They recognised costume imperfections and realised that "mistakes are not a bad thing or a fault" (RoI, P11).

Inspired by the embroidered patterns of traditional Karelian folk costume, one Finnish participant designed a two-finger "statement ring with a large decorative plate covering four fingers" (F, P14)." In his view, the innovative design honoured the traditional folk costume patterns (Figure 15).

"By combining traditional patterns with modern design, I created a piece that is both visually attractive and culturally meaningful. Through my ring, I emphasise values such as respect for tradition, appreciation for craftsmanship, and the preservation of cultural heritage." (F, P14)

"It helped me build a certain kind of identity as both a craftsperson and an artist – someone who respects tradition while seeking new ways of expression. The ring became, in a way, personal to me. I am originally from North Karelia, and it was fascinating to immerse myself in the design, crafting, and making of the piece. In a certain sense, it tells the story of my own roots and artistic journey." (F, P14)

The international online workshops helped the project team in their dissemination of project outcomes and to further advance learning and an appreciation of costume techniques. One participant commented on the similarities of the methods, particularly the use of pintucks and gathering. They explored traditional fabric manipulation and Karelian embroidery techniques (Figure 6).

Figure 6. Karelian Kivennapa coat embroidery (South Karelia Museum) inspires international workshop participants and sample by XXX.

Creative Thinking Skills

Fluency and flexibility

The textile costume artefacts inspired different responses. Each costume resulted in "vastly different products at the end," and it was interesting "seeing how everyone interprets things differently (RoI, P8)." In response to the sketching activity (RoI), some participants recorded very accurate details and representations, and other responses were looser, freeform or abstract (flexibility). Figure 7 illustrates group fluency and flexibility and participants' responses (RoI) to different costume motifs and construction features. Row 1 illustrates the wedding dress costume with a needlepoint lace seam sample, 2-dimensional (2-D) illuminations and a constructed sample. Row 2 features the dot and crescent motif from the child's costume, a costume sample, and clay, cyanotype, and lino print explorations. Row 3 shows Mountmellick whitework embroidery costume samples and 2-D mixed-media work. Row 4 presents Carrickmacross lace interpretations, including 2-dimensional work with expanding foam, thread, crochet, clay and free machine embroidery.

Two workshop outputs were generated in a Finnish context (Figure 8), including tablet woven bands with yarns dyed with natural dyes made from velvet-roll-rim mushrooms, dried flowers, rhubarb, mugwort, rowanberries, onion skins and madder, to name a few and jewellery inspired by the traditional Karelian folk costumes. It was fascinating to observe how the details of Karelian folk costumes evolved during the students' creative process, transforming into new patterns and ways of using ribbons and ribbon ensembles. Tassels, embroidery, pearls, and other embellishments—rarely seen in traditional tablet weaving—were innovatively integrated. The interplay of varying warp and weft thicknesses and weaving techniques that merged traditional methods and contemporary rougher aesthetics added another layer of interest.

In Malta (Figure 9), participants created maquettes and samples. Time availability prohibited the advanced development of designs to the prototype and production stages. However, the samples show the acquisition of technical procedural knowledge and early ideation experimentation processes, including varied use of colour and fabric and mixing traditional with contemporary fashion design influences and styles. The two online workshops were held three days apart, giving participants time to respond to the activities. Figure 10 illustrates a variety of responses, including flexibility and some elaboration.

Figure 7. Fluency and flexibility of ideas, RoI (see acknowledgement section for contribution details)

Figure 8. Fluency and flexibility of ideas, Finland (see acknowledgement section for contribution details)

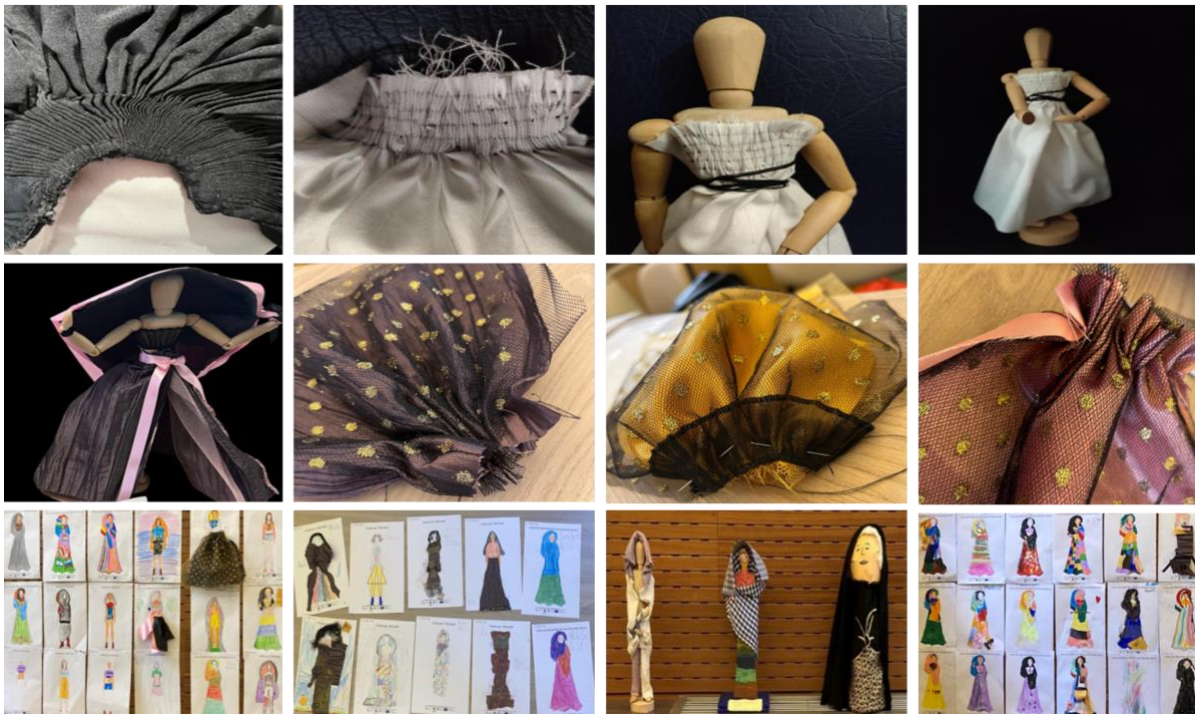

Figure 9. Fluency and flexibility of ideas, Malta (see acknowledgement section for contribution details)

Figure 10. Sample online workshop responses illustrating flexibility and elaboration

Elaboration

Some elaborate and embellished ideas emerged in the workshops. In the RoI, Alison focused on patterns and movement within the designs, and her work elaborated on these (Figure 11). She photographed the lace designs and concentrated on the lace spaces. “My pictures were quite blurry, but I liked that. There were spaces where I could see netting underneath, which was quite sharp. I like the idea of the layers and putting depth into it. It intrigued me.”

Figure 11. Development of lace design from paper to print using a stencil and lino print to the final exhibition piece, ‘Lace Spaces’ by Alison Hunter (RoI)

In a Maltese context, a group of workshop participants adopted a sustainable and contemporary approach by patchworking the base fabric used in creating a Ghonnella (Figure 12) and applying the symbolic Maltese cross to the rear of the costume.

Figure 12. Patchwork Ghonnella with Maltese Cross appliqué by Maltese university students

Originality

A few well-developed and considered designs were noted as unique or unusual. Figure 13 illustrates a lace rubbing to reveal different shapes. During workshops (RoI), costume border patterns were copied and recreated in new ways using a Truchet tile patterning technique (Lord & Ranganathan, 2006). The pattern that emerged from the lace rubbing was lifted from the drawing, and a new pattern was created by moving the tile shape around in different directions.

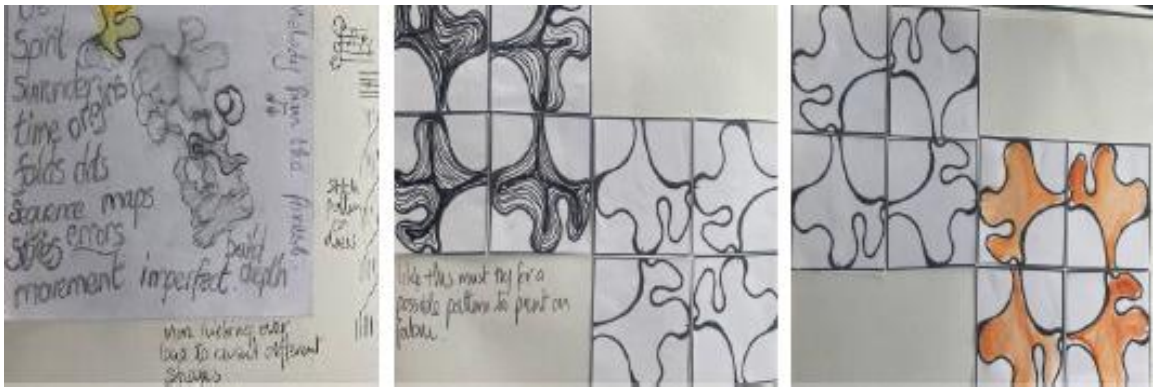

Figure 13. An original Carrickmacross lace rubbing and pattern creation by Linda Kerlin (RoI)

Another example of advanced design and crafting skills is evident in Figure 14. The student replicated the "metal raising" skill, an ancient jewellery technique. The earrings were deliberately textured and polished "to bring a sense of elegance" to the product (F, P13). What is unique in this design is that the earrings can be worn with or without the plates added behind the earlobe.

Figure 14. An original earring design by Riikka Räsänen (Finland)

Olli (F, P14), who previously referred to the importance of cultural heritage in his design process, designed a two-finger statement ring (Figure 15) "to serve both as an aesthetic and symbolic object….allowing the wearer to express their personal style and cultural heritage." The geometric shapes and colours of the Karelian costume embroideries inspired the design.

Figure 15. An original ring design by Olli Sutinen (Finland)

Another Finnish participant produced trendy "earrings different from each other because I wanted to highlight how every craft is one of a kind (F, P15)." Her endeavour involved merging tradition with modern design (Figure 16). "I aimed to challenge my aesthetic sense in a new way and expand my understanding of how tradition and modernity can coexist in design."

Figure 16. An original pendant and earring design by Veera Parsanen (Finland)

Similarly, the wedding dress tatted edge pattern (RoI) inspired a jewellery outcome (Figure 17). Molly studied the tatted edge pattern using the Perfect Magnifier Application [Perfect Magnifier mobile phone application, Netigen Tools, Kraków, Poland, 2014, version 5.0.36], recreated the pattern using different yarn and transformed the scale and outcome.

Figure 17. An original jewellery design by Molly Kerlin (RoI)

Discussion

Visual literacy involves understanding (Felten, 2008), analysing and generating images to communicate ideas and concepts (Stokes, 2002) and is viewed as an essential part of teaching and learning. Workshop participants developed visual literacy skills from costume analysis and related learning activities such as sketching and brainstorming strategies. They noticed (Vincent-Lancin et al., 2019), interpreted, and made meaning from the historical and culturally significant information afforded by the costume artefacts. The importance of craft culture (Ma, 2024) transpired in participants' responses. “Textiles are often highly emotional for their makers” (Dolan & Holloway, 2016, p. 155) as the making process can be experientially real (Pallasmaa, 2015). In this study, participants' tangible exploration of costumes and related experiential learning activities enabled the development of textile appreciation, empathy, and an emotional connection to textiles. For example, the design process allowed one participant to express his “artistic vision and cultural heritage” (F, P14). The designs that were created honoured traditions and costume patterns. Our project safeguarded and promoted cultural diversity (Ma, 2024; UNESCO, 2022) and intangible cultural heritage (UNESCO, 2022). The workshops promoted innovative practices while “nurturing and retaining craft” (Brown & Vacca, 2022, p. 590). Additionally, some workshop participants alluded to the significance of crafts in materialising experiences (Kouhia, 2016) and supporting well-being (F, P11, P13), confirming that the eudaimonic intrinsic needs of “doing, belonging, becoming and being” can be expressed in crafting (Pöllänen & Weissmann-Hanski, 2020, p. 348).

The SuoMu Design Learning Model (Finnish Association of Design Learning, 2023) was highly effective in supporting the development of creative thinking. Participants mentioned the experimental approach, freedom to explore, learning from mistakes and each other as positive

features of their learning. Groupwork generated interaction, sharing of ideas and joy in the learning process. Brainstorming, which is a group or individual creativity technique, generated "a list of ideas spontaneously" and helped participants "find a conclusion" or solution "for a specific problem" or task (Litcanu et al., 2015, p. 387). The brainstorming activities involved the generation and sharing of many ideas without censorship. Working alone, together, and working alone strategies stimulated individuals and 'alone time' allowed for the shared ideas to be integrated and elaborated on by each individual, and it avoided "fixation on a particular solution very quickly" (Harms & van der Zee, 2013).

Studying creative behaviour and measuring idea generation was a daunting process, but guided by well-established frames and models (Johnson, 2010; Torrance, 2008). Workshops generated many similar ideas (fluent), but time constraints limited the production of many original ideas. Participants developed variations quickly owing to the availability of materials, resources and technical input from workshop facilitators. We used a guided instructional approach, which supported flexible responses. Some participants focused on elaboration, which led to further flexibility and originality in the details and implementation. For instance, Molly (RoI) studied and recreated a lace edging pattern using crochet and tatting (flexibility). She considered making the idea better or more elaborate by using different yarns to vary the scale (flexibility) and add more visual interest (elaboration). Following her explorations, she created new jewellery designs and products (originality).

Handayani et al. (2021) underscore the importance of the teacher's role in increasing creativity. Teaching for creativity involves more than creating an enjoyable learning environment; it involves intentionally promoting learners' creative behaviour and thinking (Jameel & Mohamood, 2017). In our workshops, we relied on brainstorming, a recognised strategy for developing fluency and flexibility (Jameel & Mohamood, 2017). The time available for elaborate and original designing was limited, and those who produced embellished and unique ideas invested personal time in their work. Another possible reason for the lower level of elaboration and originality may be limited knowledge about the materials provided (Trisnayanti et al., 2020) and technical textile procedural knowledge in this case.

Many participants developed contemporary responses to traditional textile artefacts. Classroom teaching ideas emerged in some pre-service teachers' responses and included using group project work to support cross-disciplinary learning and impact. Workshop discussions revealed geological, botanical, and ecological influences on costume design, and they nurtured awareness and appreciation of the artefacts' ecological, economic, and social value. We adopted a sustainable approach in the planning and implementation of the workshops. Waste cotton sheets from local hospitals were cut and used for process experiments and product development (RoI). Every effort was made to use available materials to realise creative designs. One participant noted that "limited materials or the reuse of materials gives a framework in which the material guides the work (F, P12)" which is an important frame for designers as materials are a significant guiding part of the design process (Atkas, 2018). The ecological and sustainable use of materials was achieved in all workshop contexts and manifested in the reuse of materials, sourcing organic dye materials and being mindful of environmentally conscious alternatives. Additionally, the connection with nature and environmental empathy can be enhanced when connections are made to nature.

Conclusion

Despite the various positive outcomes outlined so far, we acknowledge that the chosen frameworks present challenges in implementation and data interpretation. We used the frameworks as a guide rather than prescriptively. The descriptive analysis and interpretation of creative outputs can be highly subjective. However, the analyses provided an opportunity for rich learning about participants' engagement with heritage textiles and crafting processes and their perceptions of the creative process. The use of visual and feedback data in this study "lends weight" (Hamilton, 2011) to the validity of our findings. However, generalisation to the broader population was not a goal of the study. While this study has limitations, we developed a greater understanding and awareness of our approach to developing creative behaviour and thinking skills. Visual research methods have immense potential, and the possibility exists to extend this work further to include visual participatory research, where participants comment on their designs.

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