'ART EXPERIENCES' AS DISRUPTIVE IMPULSE, AND MENTORING FOR NEW DESIGN ENGINEERING EDUCATION STRATEGIES

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ABSTRACT

This research study questions the significance of *understanding* what it means to create the change by design in context of today's knowledge and self-management, and also to advanced design engineering education. Needless to say, holistic, sustainable and humanity-centred education begins as early on at preschool. In the future, a central interest of 'good design' is to ensure that the planet 'profits,' by utilising a variety of 'art of languages' in an interlinked way: The synergy of an art pedagogical + design didactical approach in schools and at universities, not only manifests collaborative designing across the generations; it is also giving rise to a revaluation of fine arts and the multi-level benefit of art and design, e.g., core factor in supporting self-belief as training element of mentoring culture, which supports Initial Teacher Education (ITE) systems of design teachers, which calls for you to trust your intuition to develop an excellent 'personal intelligence.' To train the trainer with embodiment, will focus on three key factors: - teaching various design methods, - developing the fundamental self and knowledge management of individual and digital systems, - including (cross)cultural education. The 'trainer' and her/his concept of leadership count. Design didactic knowledge and 'motivation to act-instruments,' these experiences, are part of the best students' education for next design engineering mentor.

Keywords: Design didactic & art pedagogical education, mentoring as part of design engineering education, innovation by disruption with art experiences, Initial Teacher Education + intuition, motivation to act – instruments

1 INTRODUCTION

Since 2019 we discussed a 'revaluing the manual sketching experiences' [1] of children, such as drawing in the sand, as well for designing good within a mixed or Augmented Reality (AR). Respectively, this research paper focusses on two significant directions for action:
First, harvesting the synergistic benefit of an art pedagogical + design didactical approach in schools and at universities (see chap. 2 + 4). Here, new collaborative partnerships in the field of 'Kids and Designing' should be developed (see chap. 3). Second, incorporating new profile elements to curricula to help develop a 'mentoring' culture in design engineering programmes (see chap. 3.2 and 4) and set a new standard for the future. This will get good design back on track.
Also, during the covid 19 crisis, the question arose again regarding the value of 'fine art' and its benefit to society and individuals, as well as the method of learning (see chap. 3.2). This question seeks to reveal the significance of *understanding* what it means 'to gestalt, to know, and to be capable;', when philosopher Hannes Böhringer focussed his research on asking: where would the sciences be 'without the art of language, without the rhetoric of pictures and the art of persuasion'? [2], what are the sciences without the power of poetry, of artefacts, and the variety of senses (e.g., expressed by music, literature, art or design ideas)? This is a fundamental question for our knowledge management today.
We must rebuild learning landscapes to create playful learning spaces for young children, as they are essential to the 'gestalt' process, in the sense that creating, designing, and promoting sustainability begins with children's ability for self-expression, using the power of their bodies, hands and minds. This is an essential element of 'embodiment' (see chap. 4): creating learning spaces that promote capabilities and a 'yes you can' atmosphere (and mentality); However, from an art pedagogical point of view, the most important thing for the creation process is the joy and curiosity regarding the environment and the courage to take action and do something [3], which can be transferred to doing design. This is important,

as we consider that 'from the neurological point of view, these connecting areas in early primary basic education set the ability to interpret in complex patterns and give the ability of abstract thinking' [4]. According to Helga Nowotny, a social scientist, the capacity of curiosity and preference is an important factor in creating the new or seeing things as new [5]. The unexpected influences the beauty and expression of time – just as in modernity and modern cities [6], Nowotny explores the idea that innovation has to be associated with our ability of knowing things from the past, through the unexpected intertwining of times and the standards of science, technology and societies [7]. This dilemma, to find a balance between science and technology, in relation to the emotion of the human beings involved in life as it is – this is our cultural resource (see chapter 4). Only by recognizing the differences between the times, gives the opportunity to *ideate* the new, which is then accepted and esteemed as being better.

The case studies that examine and compare the social value of graffiti's artistic merit and the social benefit of sgraffito ornaments on buildings, allow us to get a deeper understanding of the research thesis: the art of languages in different creative disciplines are shaping humans' everyday experiences, while also contributing to all sciences and applied sciences – including but not exclusively in design and architectural scientific issues. From the art pedagogical, design didactic and holistic – primarily anthropological - point of view, how many 'art and design languages' are needed to 'design' our future? How much knowledge of art is needed for a well-educated person (pupil) to be able to design and be prepared for the Post-Digital Era; and how much knowledge of design/ing is needed for studying the fine arts, thus being beneficial to our cultures and societies – including the perspectives of STEM disciplines? Knowledge management relates to the method of 'mapping' [8], which enables the next experts of good design to develop key competencies, such as reflection and being able to formulate questions relevant to the system. This requires an education with a design teacher, who serves as a mentor, thus enabling designing across generations. The next chapters will discuss whether we need a 'mentoring culture integrated into self-management' programmes, in context to coaching-courses and ITE, and answers to the questioned significance of a revalue of artistic experimenting and experience spaces - for designing our future.

2 GRAFFITI AND S'GRAFFITO: AN ALLIANCE OF ART AND DESIGN

2.1 Graffiti a synaesthesia of fine art and design and the design pedagogical approach
In order to answer the research question focussing on the benefit of fine art, design, and engineering as a whole, let us break down the borders of disciplines:

When we look at graffiti designs in the year 2022, two main questions arise: What is new, or *different* in graffiti, as a form of abstract and artistic self-expression in the city, as compared to previous years? How can the phenomena of graffiti in cities evolve in 2022 – what kind of a statement and symbolic representation of culture in time will they portray - as part of architecture and expression of identity? And what about the benefit and the different meanings, when children create graffiti in the safe environment of their pre-school, or as teens at a hidden place in the cities wall-paintings scenario?

On the one hand, graffiti is a 'reference letter' [9] from history and a testimony of our culture in art, as it was for Banksy in particular moments in time, which still speaks to us today. Graffiti as art could be seen as a development in the decoration of cities. This can be compared to 'sgraffito' used in the past – as well as today – as graphical patterns and decoration on architectural facades [10]. Yet, on the other hand, graffiti in art and design are also artistic expressions of revolutionary cries; it represents the youth's rebellion. Very often it is done on secret paths and by young people at night – this entails spraying on facades (see fig. 2), walls, and surfaces of railways and trains – to revolt against societies conventions, law and order. From the art pedagogical point of view, the 'act' in relation to joy [11] experienced during the process of spraying on the wall, for example, is an important element of development – the process of humans' self-discovery. (see: fig. 1 and 2),

Doing design by ideating with your *hand* enables different experiences, in contrast to *talking* about design codes. When we look at the phenomena of emotional appropriation it is important to use a new 'design pedagogical' [12] point of view, by regarding the parameter of 'design codes' and 'product language' as symbolically meaningful representatives (see fig. 3), of a society. Dagmar Steffen puts the understanding of symbolic meaning in relation to the psychological effect of representatives. 'Representatives' in this psychological and sociological context refers to the ideas, images and thoughts in association to the object, that declare the relationship between human beings and this object, while also 'paving the way' [13] for the emotional appropriation of this object.

2.2 S'grafitto and the design didactical approach

Today, at the beginning of the Post-Digital Era, patterns and ornaments are crying for attention. In the past, the meaning of ornaments was interpreted differently, and was viewed in different artistic, societal and design historical contexts: '*styles and methods of ornaments were based on a progressive accumulation of tradition, religious influences, technical advances as well as the availability of materials, the exigencies of climate, the wealth and stability of societies, and the whims and ambitions of individual men, whether tyrants or artists.*' [14].

Comparing architectural facades, fashion designs and art in urban environment with graffities as artistical patterns and codes in cities' (see fig. 3) designs – they come alive with patterns and ornaments, symbolic meanings of time. We have to read into these ornamental codes within the cultural (historical) context of the Modern and Post-Modern Era compared to those of the Post-Digital Era.

Figure 1. Graffiti by Max at the age of 10, Figure 2. Graffiti by 15-year-old (teen) – Max, Figure 3. modified street sign, Florence, 2001; Figure 4 'street-art inspired design' - K. Grobheiser

As well in comparing this with design didactical and art pedagogical significance. This view and the artistic expressions allow us – citizens, artists, designers, as well as children – to learn from each other. At the same time, the significance of fine art in graffiti – which involves designing, sketching and spraying, that span cultures and generations (fig. 1: 6-year-old child fig. 2: graffiti by 15-year-old teenager), is providing a design theoretical and socially resilient view of sgraffiti design that is good. It is good for integration because it is uniting and embracing cultural codes and 'embracing the unknown' [15] as 'differences' like the 'otherness' in society (see fig.4 by designer K. Grobheiser, inspired by the street-art and style at New York).

In the end, graffiti as cultural rebellion and remembrance is triggering the art pedagogical and design didactical effect on society – in particular, the experiences of the future generations. We have to 'embrace,' or rather withstand this dilemma – like Nowotny means when talking about the unexpected intertwining of times and the standards of science, technology and societies – to create the new and different as something good.

3   MAPPING THE WORLD + SUSTAINABLE DESIGN EDUCATIONAL STAGES

3.1 Artistic experiences + self-management as (social and economic) trigger points

Graffiti and S'grafitto present the world in a different way, which elicits the core question: how we create our 'picture' of the world? Georg Peez argues that creating pictures (including graffiti) is elementary to developing a personal belief system, self-confidence and developing the ability to express and reflect the internal pictures by the individual from an art pedagogical perspective [16]. Julia Wendemuth underlines, that visual impressions have such diverse impacts on each individual, as seen from a scientific art didactical point of view: On an initial level, artistic images have content-related, historical and symbolic and semantic meaning. Second, as a viewer we question what and why an artists created, and what it means to them. Third, when interpreting images, didactical elements help you to reflect upon, perceive, question and classify this picture [17].

If the concepts of the inner self understanding of the artist, the creator is related to self-consciousness confidence and belief systems, the elements of this 'system' – or the concept of making yourself an image of the world – are crucial for developing a personal value-system; - which is the key to making a sustainable life and creative studies possible on our planet. Art can express so many values, self-beliefs and relation to other persons and to the planet, like graffiti + sgraffito articulate with narrative character to all people. – express identity of each time in a related pattern, to coloured (figurative) arrangement.

To underline the thesis above – of the benefit of future synthesis of art pedagogical + design didactical outcomes -, we could learn from each other. The paradigm shift towards sustainability and digitalisation calls for new leading educators. '*Although education alone cannot achieve sustainability, it is obviously one of society's keys. Educational objectives require a fundamental shift – from learning how to*

memorize and understand, to learning how to think in new, systematic way.' [18]. It is beneficial when learning is taught within credit systems at schools and universities, by using 'formative assessment and feedback training and experience' instead of summative assessments (this includes preparatory pre-design educational experiences at preschool). Collaborative learning and learning how manage self-learning programs show positive effects, when used in combination with interactive peer-tutorial programs and webinars, using digital, interactive learning spaces. Sustainable future education should be value-based, due to the demand for changes relating to climate change, inclusion and diversity. [19] 'We need earlier design education (strategies) at primary schools, which may coincide with a change in the terms 'design' and 'industry' [20], as well as fine arts, because the right to experience cultural education and gender equilibrium is one of essential goals of the SDGs, which relates to UNESCO's 'Education of Sustainable Development' (ESD) program.

3.2 'Change' by ESD in 'design languages' to come with Mentoring and ITD

In the Digital Era, learning and working conditions have been undergoing a change and enabled new skills, such as 'train the trainer' and 'inner conflict coaching' – in addition to the array of self-learning programs for all education levels. Short in-house webinars have also been used in companies to support value-driven corporate social responsibility (CSR). Within this area the question arise, would a 'mentoring culture' as education tool be beneficial, by adding it to the curriculum – being prepared?

The pre-requisites for the inner conflict coaching mentioned earlier are: first, self-awareness, self-reflection and self-motivation [21]; and second, personal, face-to-face coaching, which has gained value and addresses the effect of psychological involvement and embodiment. The role in mentoring as a design teacher [22] is quite a different, as it takes on an outside perspective to skill transfer in a traditional way [23]. Different 'languages' reflect the different perspectives of the trainer, coach or mentor and results in the outcomes. Personal trainings focus on pre-framing a situation within the enterprise later on and need to be integrated into the conventional curriculum as part voluntary courses in-house University. Coaching is more cerebral and is influenced by the coaches psychological and philosophical background [24], mostly from external and specialised business fields.

Mentoring as an additionally honoured credit, is currently not part of curricula, however, such content is becoming increasingly relevant in the design engineering shift that is in progress. In these times of 'uncertainty,' emotional intelligence is fundamental for self-confidence and mental stability. The current Digital Era, is causing us to discuss the value and benefit of 'Artificial Intelligence' for society, along with 'Emotional Intelligence' [25], which are both needed in addition to 'Personal Intelligence'. The latter two will be essential key competencies for mentors involved in the Initial Teacher Education (ITE) and learning methods, in the coming years.

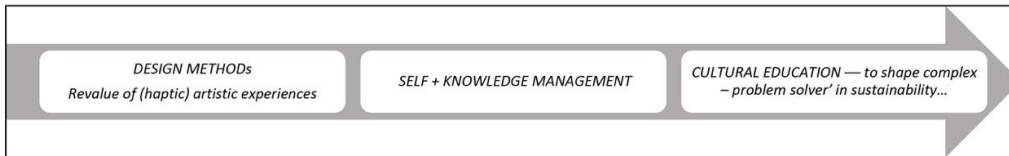Mentoring in design engineering improves the creative process and results because it:
- provides the mentee a positive, stress-free environment that is non-hierarchical - in a 'flow'
- reflects an open-minded and integrative mindset, designing atmosphere that allows failure,
- allows playful designing,
- provides challenging tasks and experiences, helps you develop by exploring your limits,
- promotes emotional appropriation through intrinsic motivation and positive associations,
- develops personal intelligence carefully as well as a balance of mind and emotion.

The designer James Skone uses the term 'educare' [26] as the essence of deep design mentoring.

4 TRAIN THE TRAINER WITH *DISRUPTIV* DESIGN METHODS AND 'MOTIVATION TO ACT – INSTRUMENTS'

As we have shown, from the art pedagogical, design didactic and scientific perspective, the future educational systems for design engineering need to include a revalue of artistic experimenting spaces, a designing atmosphere to support self-belief by different (and multi-sensual) designing methods and: three key factors, mentioned above (see: table 1). Once implemented, ITE can benefit from interactive learning through cross-generational models: older experts – who serve as mentors and experts for the students – and students who mentor the children, can all design together. Cross-generational designing should be part of future university curricula, in answer to the need for good design = sustainable design. In the future, a mentoring culture could be worthful by courses like 'sustainable living.' 'Needless to say, holistic education begins early on.' [27]

Table 1. Key factors for future design engineering education, the author, 2021

| DESIGN METHODs Revalue of (haptic) artistic experiences	SELF + KNOWLEDGE MANAGEMENT	CULTURAL EDUCATION — to shape complex – problem solver' in sustainability...

Although all three key factors – teaching various design methods, developing the fundamental knowledge management of individual and digital systems, and including cultural education – will have a positive influence on the 'trainer' and her/his concept of leadership is important. Leadership, according to Hans Hinterhuber, goes hand in hand with management. However, it is essential that they are able to combine their skills in terms of 'character,' 'knowledge' and 'action,' in order to open people's minds to resilient visions, and convince and motivate them. To complete a change process in education strategies, we have to distinguish between a trainer and a coach first:

Coaching means providing problem-based mental and emotional analyses and personal psychological consulting. This leads clients to change their perspective from the problem to a distinct solution [28]. According to neuroscientist and coach, C. Sander's, coaching also evokes the motivation to 'do' and 'act,' which is quite relevant for the changing process, as well from the philosophical point a view, by Corine Pelluchon, and art pedagogical point of view, by Georg Peez, both underlined in 2018 [29].

This leads us to training the trainer: as 'training' is original focussing on physical performance, the key skills for being a leader in sustainable education with a holistic view. As such, in the next years, 'embodiment' will play an important role in various instances: self-learning and coaching, design engineering education, change management, and personal intelligence. For the preschool teacher, embodiment means the combining mindful and corporal development and understanding bringing hand and mind together [30]. Learning in terms of embodied cognition is connected to a person's values and their self-motivation, leading to change. Self-perception and how you perceive the world and as described for 'imaging' in chapter 3.1., relates to artistic and design concepts, as well as to the design (or creative) method, for example the method of 'mapping'.

Table 2. 'Motivation to act - Instruments' in Design Engineering Education, M.Wachs, 2022

Embodied Cognition	To Train: Trust in Intuition	Skin in the Game
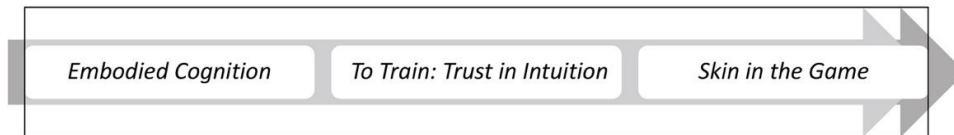
Intuition is seemed to be one core element in design education, as James Skone stated, it is a big challenge for the design educator to become a mentor. As design teachers, we have to fulfil both roles: to mediate knowledge and train each student to develop their ability to reflect, while mentoring future design engineering experts. Ergo, it would be best to educate our future mentors of good design in a sustainable and holistic manner, now. As a mentor you have to be at your students' side and support a 'motivation to act' skill, by the instruments of: – embodied cognition training, - trust in intuition – skin in the game character (see table 2). As a design engineer, we have learned to collect information and to transfer (mapping methods). In this process, our intuition is our best guide to achieving a mood, creating and expose images that relate to our personal belief system – as graffiti as mentioned at the beginning of this text. The beneficial experience of design didactical learning systems forms part of the foundation for art didactics and art pedagogical knowledge, as compared to Peez, Wehmeier, Piaget and other cultural and education scientists.

When it comes to self-management in using design didactics learning formats and in addition of mentoring culture, it comes to 'designing good,' in a sustainable manner: In this sense the 'art of languages' integrates holistic view and relate directly to human-centric material codes. So, we return to the initial question that seeks to reveal the significance of *understanding* what it means 'to gestalt, to know, and to be capable.' As we move forward, we will be using disruptive artistic experiences and 'motivation to act - instruments' to create the sustainable future as design engineer mentor.

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Figures:

[1 + 2] Max as 6- and 15-years old boy sprayed, 'FLY, pic.: Wachs M.-E. 2003 and 2012.

[3] Street sign – modified by unknown person, Florence, 2001, pic.: Wachs M.-E. 2013.

[4] 'Street art inspired design', pic. and design by Grobheiser K.

Tables:

[1] 'Key factors for next education in design engineering', 2021. table.: by Wachs M.-E.

[2] 'Motivation to act - instruments', 2022, table.: by Wachs M.-E.