



# The Heptagon of AUX Model: Development of a Synergising Model on Aesthetic Experience and User Experience through the Fuzzy Delphi Method Towards Augmented Reality Comics

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**Abstract.** This research paper aims to report the development of a synergy model from two different fields of knowledge, namely Aesthetic Experience (AX) and User Experience (UX) using Fuzzy Delphi Method (FDM). This model was put forward in order to fill the theoretical gaps in the context of technology-based arts application, such as augmented reality comics (AR comics). Most technology products only measure UX elements even though there are strong artistic elements on the product and vice versa, when most art products only measured at AX despite using the dominant technology on the product. Constructs and elements were built using a methodological review of six models, three from each AX and UX models. In the methodological review, the elements of AX and UX are synergise and are used as research items as constructs and elements for expert consensus process. A total of ten experts, constitute of half from each comics and AR related expertise were used to gain consensus on 16 constructs and 39 elements of AX and UX. The analysis was conducted based on FDM conditions, namely expert consensus >70%, threshold value (d) < 0.2, and fuzzy score,  $a_{max} > 0.5$ .

**Keywords:** Aesthetic experience · User experience · Fuzzy delphi method · Augmented reality · comics

## 1 Introduction

The advent of new media technology since 1995 has allowed for massive changes to the creative world as a holistically. Information is at our fingertips, connect via email and watch videos via the YouTube application. There is no doubt that the comic industry is also moving in line with the technology that is present and with that, comics were produce in the form of web, interactive comics and motion comics. Now with the prevailing of industry revolution 4.0, the comics industry is changing rapidly with the birth of mix-reality technology. Now comics are produced with mix-reality technology with a combination of comics as artform and Human-Computer Interaction (HCI) technology. In reflection, comics are objects of art use aesthetic elements in the production process

and AX during the measurement process. While on the other hand, mixed-reality technology especially AR, is HCI based and uses UX as its measurement method. Of course, there is a big gap when the combination of these two disciplines occurs and need for a new model as a guide line in the production and measurement process.

## 2 Literature Review

In the literature review, the researcher uses methodological review techniques to obtain the elements of AX and UX and in order to stimulate the research questions namely; what is the similarity and dissimilarity of AX and UX construct and what are the construct and elements suitable to be synergise for AUX model. In the case of AR comic, the two major components are AX for comics and UX for AR then researchers need to cover up these two major theories as a synergy for the new model.

### 2.1 Aesthetic Experience (AX)

In Hagman [1], Plato states that AX is the reflection of idealistic aesthetic objects such as flowers, mountains, beautiful faces, music, theatre, dance, and painting. The uniqueness of relationship on the aesthetic objects and the preoccupation of experience that is as a source of AX [2]. Aesthetic experience is often associate between perceptions and feelings [3]. In contrast, the sensitivity towards both is integrated with the idealistic feelings such as refine pleasure, delight, awe, admiration, and joy. Furthermore, affects and passions considered to be of unique positive value [4, 5]. However, emotion and sensation are a proponent of mental experience, thus the AX source not only to the object or pleasure but also to the subjective knowledge of the universal idea [6]. Docherty [7] emphasises this subjective knowledge as compiling the universal conceptualisation that shapes the basis of our judgment. Under the circumstances, the AX involves several stages of the mental process, which must be passed. Among them is the stage of creating (artist) appreciation (artist, beholder, expert) and appraisal (artist, beholder, expert). These stages are based on cognitive, emotional and perceptual domains to ensure the synergising of AX. Intensely, other scholars have studied over 50 emotions applied to aesthetic objects and events such as concerts, musicals, dances, art exhibitions and films [8]. Consequently, seven emotional constructs were proposed, namely: negative emotions, prototypical aesthetics emotions, epistemic emotions, nostalgia, animation, sadness and amusement.

In the discipline of comic art, AX element has long been practiced as an affirmation of the imagination and surprise inveighing beyond the soul's pleasure are called playful or humorous. It is necessary to strengthen the integration between humour and AX designed to evoke amusement regardless of what aesthetic paradigm is in the various comic genres such as satire, parody, lampoon, burlesque, caricature, farce, slapstick and limerick.

### 2.2 User Experience (UX)

The early HCI discover the involvement interaction of computer with humans. However, the massive development of the research has widened the role of HCI to multidisciplinary

and encompasses almost all information technology designs and all communication devices. When it comes to human experience in HCI, the concept of the experience itself is more closely related to how the human experience interacts with a technology product. Concerning this, Azzawi [9] outlines the concept of experience in technology, namely, time and experience, as an essential concept in the context of experience because experience has a duration, and judgments of such duration changes as the experience unfold. Discussing the UX, we need to understand the fundamental concepts of UX such as what experience to measure, how to define the experience in order to react to a technology product, and what to do after reviewing each of the potential variables.

Formally, ISO 20101 defines UX as involving human perceptions and responses or expectations of responses using a product, system, or service. It is relevant to the UX, including emotions, beliefs, preferences, perceptions, and physical and psychological responses. Hence, the use of such products also potent reflexes to the behaviour and achievements that occur before usage, during usage, and after usage of the product. Thielsch and Thielsch [10] emphasize that there is a difference between usability and UX. In contrast, UX has a global objective goal to achieve effectiveness, efficiency, and satisfaction and enhance holistic UX from anticipation, interaction, and reflection of the experience. Hassenzahl [11] point out that the focus of UX is on the positive outcome of the interaction and the usability theory, which diffuse on pragmatic aspects that can be objectively defined. If it involves the UX to measure such aspects of the stimulus, product introduction, appeal, aesthetics, trust, and privacy are all subjective and very dynamic affected by various factors.

UX can be a larger entity, encompassing usability and the pragmatic and hedonic aspect of a system [12]. UX can be an AR system element such as the visual, sound, haptic, and 3D environment from an AR point of view. In a practical sense, UX can enhance the user reality and specific content of a system. Nowadays, UX constructs more attention from many studies in HCI, especially in AR products. The user needs to go beyond functionality and shift to experiential perspectives to touch the usability and cognitive, affective, aesthetics, and positive feelings towards the product. Under the circumstances, the knowledge of end-users potentially requisites the analysing what kind of experience is expected to evoke. Concerning this, the research knowledge preparedness to be used in UX design, especially in augmented reality service. The UX itself involves several stages of the mental process, which must be passed. Among them is the stage of developing (developer) to the end-user (target users). In a practical sense, these stages involve several elements likewise, valuable, UX characteristic, emotion, usability, assessable and desirable [13, 14].

Scholars have collected the UX constructs and elements from previous studies using technology, including the usage of AR technology namely; efficiency, increased awareness, inspiration, motivation, creativity, liveliness, meaningfulness, playfulness & entertainment, captivation, intuitiveness, and tangibility [15]. These constructs and elements will be in synergy with AX and UX to obtain expert consensus at the next level, namely the FDM.

### 2.3 Augmented Reality Comics (AR Comics)

AR is one of the platforms included in MR representing the interoperability platform currently used in various fields. Popular in military, medical and aerospace, AR is now widely used in education, games and arts [16]. The term AR first appeared in 1992 in the HUDSET research project during designing and prototyping processes. In a practical sense, the technology enabling this access interface call heads-up (see-thru) combined with a head position sensor to workplace registration systems [17]. The augment of the visual field of the user information concurrent with reality manufacturing task, overwhelm the human-involve operations, and they call the system is AR technology [18, 19].

AR is a technology that allows an interactive three-dimensional environment and virtual imagery to be overlaid the real objects [20]. This statement is fully supported by other scholar [21], that emphasis an AR system must have the following properties such as, combines real and virtual objects in the real environment, runs interactively in real-time and register real and virtual objects with each other. AR comic was first introduced commercially in 2016 when Stuart Campbell, a comic artist who produced a comic with an AR application and sold it online. Comics have evolved in line with technology but still retain the aesthetic elements. The use of technology enhances the user experience and sensation, while reading comics with the integration of technology and art [22, 23]. In this study the researchers have selected an existing AR comic published by Marvel, entitled Master of the Sun as a stimulus to gain expert consensus by employing the FDM. The comic uses AR technology entirely in conveying the narrative.

## 3 Fuzzy Delphi Method (FDM)

In this study, the researchers excerpt FDM as a method in order to obtain expert consensus in the context of formulating new constructs and elements to develop an AR comic prototype. The selected experts are heterogeneous and this is in line with the FDM technique itself [24]. The selection of respondents for this phase comprises an appointed panel of experts to validate constructs and elements in the previous MR process. Concerning this, ten panelists are appointed, each representing comics and five others representing AR. Experts' selection is determined by more than ten years in comics industry and has produced conventional and contemporary comics. The criteria considered are qualifications for AR experts, involvement in the new media industry and recognised expertise. Because these two experts are heterogeneous, therefore, a total of ten experts are sufficient to obtain empirical data [25].

A methodological review aims to identify the integration of relevant models and theories. Indeed, for the purpose of critical readings, it was made on three models and the idea of UX [11, 12, 26]. Furthermore, through the process of screening, selection, integration, and formulation are critically coupled with identifying UX elements for AR to get the constructs and elements in the UX. The same concept is applied to the theories and models of the AX. Three models are integrated, filtered, and formulated to identify the elements of AX for comics and further identify the constructs and AX elements. The three models are Redies [27], Leder, et al., [28], and Markovic [29]. On the other hand,

the constructs and elements that have been identified and adapted from several studies [15, 30–33]. As shown in Table 1 below:

**Table 1.** Methodological review proses of construct and element of UX and AX

The construct and element of UX		
No	Construct	Element
1	Efficiency	Time, effort
2	Increase awareness	Feeling of discovery, feeling of insights
3	Inspiration	Cognitive stimulated, encourages, eager to try new things
4	Motivation	Being motivated, Interaction proactivity
5	Creativity	Self-expressive, creative
6	Liveliness	Vivid, dynamic
7	Meaningfulness	Personal meaningful, relevant
8	Playfulness and entertainment	Joy, amusement, playfulness
9	Captivation	Captivate, immerse
10	Intuitiveness	Human likeness, naturalness
11	Tangibility	Concreteness, coherence
The construct and element of AX		
No	Construct	Element
1	Amusement	Love, funny, cheerfulness
2	Paradox of tragedy	Tragic, Grotesque, Macabre, Horrible
3	Mental jolt	Bizarre, fantastic
4	Harmony	Verisimilitude, accuracy
5	Storytelling clarity	Surprise, drama, amazement, authenticity

### 3.1 FDM Initial Model Formulation

The ensuing process formulation of the AUX model from the result of the findings of the expert consensus in the FDM process earlier. In this process, the acceptable constructs and elements will be arranged to determine through the process of accumulation, merging, and altering constructs and elements appropriate to the AR comic. The ranking of each element will also be studied as a guideline to merge, accumulate or alter the constructs and elements affording to the AX and UX models as well as the SLR process carried out.

16 constructs and 39 elements that have been collected through the methodological review process were used as random items for expert consensus. Seven levels of fuzzy scale were used and FDM analysis was performed based on triangular fuzzy number, defuzzification and ranking. The triangular fuzzy number represents the values  $m_1$ ,  $m_2$  and  $m_3$ , which is the  $m_1 =$  minimum value,  $m_2 =$  reasonable value and  $m_3 =$  maximum value (refer Fig. 1). Purposely, to produce a fuzzy scale in order to translate the linguistic variables into fuzzy numbers (refer Table 2). On account of this, the higher of the fuzzy scale of the exact data will obtain [34]. Conversely, the defuzzification process involves media values between fuzzy numbers (0–1), and the significant value is below 0.2. This means that measure items or constructs are accepted based on expert consensus. Meanwhile, the pros of ranking are to manage the construct and item according to the chronology of the main and ultimate construct that been occur by expert consensus.

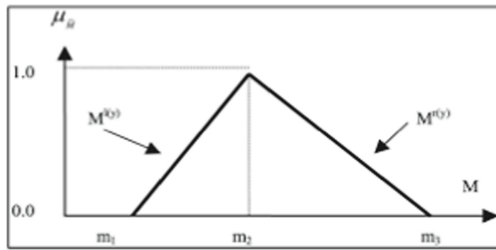


Fig. 1. Triangular fuzzy number

Table 2. Seven-level fuzzy scale of consensus

Linguistic variables	Fuzzy scale
Extremely disagree	(0.0,0.0, 0.1)
Strongly disagree	(0.0, 0.1, 0.3)
Disagree	(0.1, 0.3, 0.7)
Moderate	(0.3, 0.5, 0.7)
Agree	(0.5, 0.7, 0.9)
Strongly agree	(0.7, 0.9, 1.0)
Extremely agree	(0.9, 1.0, 1.0)

Table 3 postulates the value of three main conditions in FDM: Percentage of expert consensus, Threshold (d) value, and defuzzification (Fuzzy score). In this case, the percentage of expert consensus is the main entity, and it is identical significant to be the foundation for the acceptance of constructs and elements, then the threshold value and so on is the fuzzy score [35]. Based on FDM conditions, it must be stress that threshold,  $d \leq 0.2$ , expert consensus percentage  $>70\%$  and fuzzy score,  $A_{max} > 0.5$ .

**Table 3.** Overall acceptance and rejection construct and element of AX and UX

Construct	Element	Percentage	Threshold value	Fuzzy score	Consensus	Ranking
Amusement	Love	40%	0.187	0.653	Reject	
	Funny	70%	0.179	0.767	Accept	2
	Cheerfulness	80%	0.155	0.803	Accept	1
Paradox of Tragedy	Tragic	50%	0.147	0.710	Reject	
	Grotasque	50%	0.165	0.520	Reject	
	Macabre	90%	0.178	0.617	Accept	1
	Horrible	70%	0.233	0.613	Reject	2
Mental Jolt	Bizzare	60%	0.196	0.777	Reject	
	Fantastic	70%	0.135	0.847	Accept	1
Harmony	Verisimilitude	80%	0.145	0.820	Accept	1
	Accuracy	70%	0.172	0.797	Accept	2
Storytelling Clarity	Surprise	90%	0.103	0.910	Accept	1
	Drama	100%	0.126	0.783	Accept	4
	Amazement	80%	0.107	0.863	Accept	2
	Authenticity	70%	0.145	0.857	Accept	3
Tangibility	Concreteness	30%	0.221	0.680	Reject	
	Coherence	60%	0.215	0.763	Reject	
Intuitiveness	Human likeness	20%	0.228	0.687	Reject	
	Natural	50%	0.304	0.590	Reject	
Captivation	Captive	50%	0.217	0.807	Reject	
	Immersive	50%	0.264	0.770	Reject	
Playfulness & Entertainment	Joy	20%	0.232	0.733	Reject	
	Amusement	70%	0.205	0.770	Reject	1
	Playfulness	60%	0.192	0.810	Reject	
Meaningfulness	Personal meaningful	80%	0.162	0.757	Accept	1
	Relevant	60%	0.208	0.797	Reject	
Liveliness	Vivid	50%	0.172	0.727	Reject	
	Dynamic	70%	0.157	0.830	Accept	1
Creativity	Self-Expressive	70%	0.191	0.813	Accept	2
	Creative	100%	0.049	0.947	Accept	1
Motivation	Being motivated	70%	0.185	0.837	Accept	1
	Interaction proactivity	70%	0.188	0.737	Accept	2

*(continued)*

**Table 3.** (continued)

Construct	Element	Percentage	Threshold value	Fuzzy score	Consensus	Ranking
Inspiration	Cognitive stimulated	80%	0.107	0.863	Accept	1
	Encourages	80%	0.155	0.803	Accept	3
	Eager to try new things	70%	0.193	0.847	Accept	2
Increase awareness	Feeling of discovery	70%	0.135	0.847	Accept	1
	Feeling of insights	80%	0.157	0.807	Accept	2
Efficiency	Time	70%	0.135	0.767	Accept	2
	Effort	70%	0.125	0.837	Accept	1

The formulation process begins by analysing constructs with only one element combined with the appropriate construct and has more than one element. With reference to this, for AX, two constructs have only one element, which is the paradox of tragedy (macabre) and mental jolt (fantastic), while for UX two constructs have one element namely liveliness (dynamic) and meaningfulness (personal meaningful) (see Fig. 2). By the same token, some constructs have been retained, and some constructs have undergone a rebranding process in terms of construct names due to the addition of elements that make the construct stronger and more appropriate. The storytelling clarity construct has received additional macabre and fantastic elements from the paradox of tragedy. Mental jolt constructs create the new construct name from storytelling clarity to storytelling only and both elements from the AX component.

The amusement construct from the AX component has received an additional two elements from the creativity construct under the UX component, namely self-expressive and creative. In other respect, the creation of the amusement construct has four elements: self-expressive, creative, funny, and cheerful. For the harmony construct, the elements have been integrated with the liveliness construct from the UX component, which is dynamic. This construct contains three elements: accuracy, verisimilitude, and dynamic. The original construction of the UX component that increases awareness has been changed to mindfulness after being added with the personal element meaningful is a construct from the UX component that is meaningfulness. It must be stressed that the UX component's efficiency construct is maintained and the original construct from the UX component that is motivation has been renamed to the incentive to make it more suitable for the AUX model to be developed.

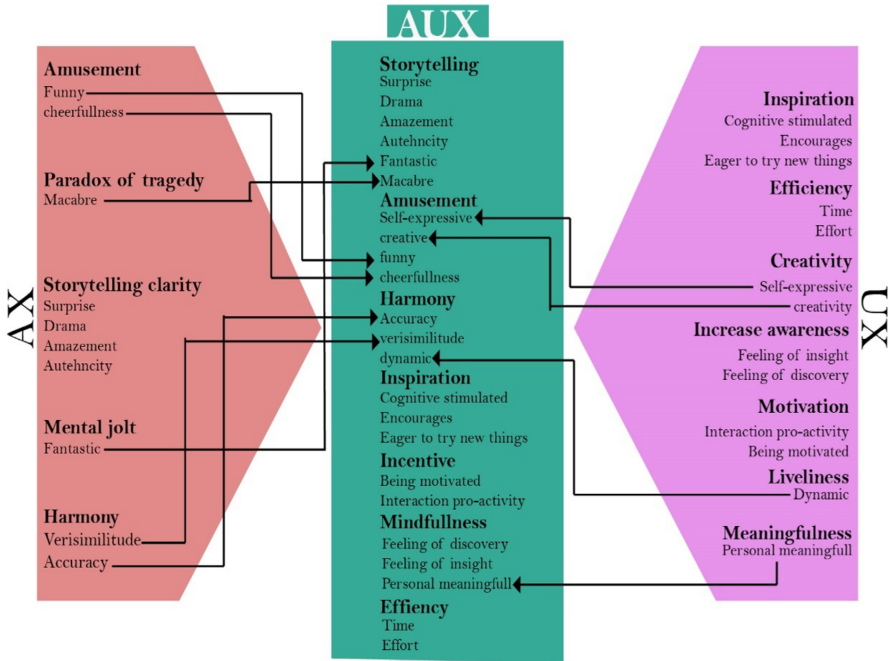


Fig. 2. The formulation of the AUX model

## 4 The Heptagon of Aesthetic User Experience (AUX) Model

The heptagon of the AUX model (Fig. 3) was taken in conjunction with celebrating the shape of a heptagon that has seven corners representing the seven AUX constructs and 24 elements embedded in it. In such a case, it becomes the basis and guideline for the production of aesthetic products that use HCI devices. The description of each construct and element is as follows:

### 4.1 Storytelling

Storytelling constructs are among the main agendas in the AUX model as a narrative aesthetic product. In this case, it is supported by an element of authenticity that is able to provide novelty value. In addition, surprise, drama, fantastic and macabre elements can stir emotions and publish a sense of amazement.

### 4.2 Amusement

Amusement is self-expressive born from a creative point of view, and in the context of AUX, it is a manifestation of self-expression, creativity, funny and cheerfulness. The value of amusement is applied in AUX as a reflection of the basis of the beholder aesthetic object’s emotion and aesthetic experience.

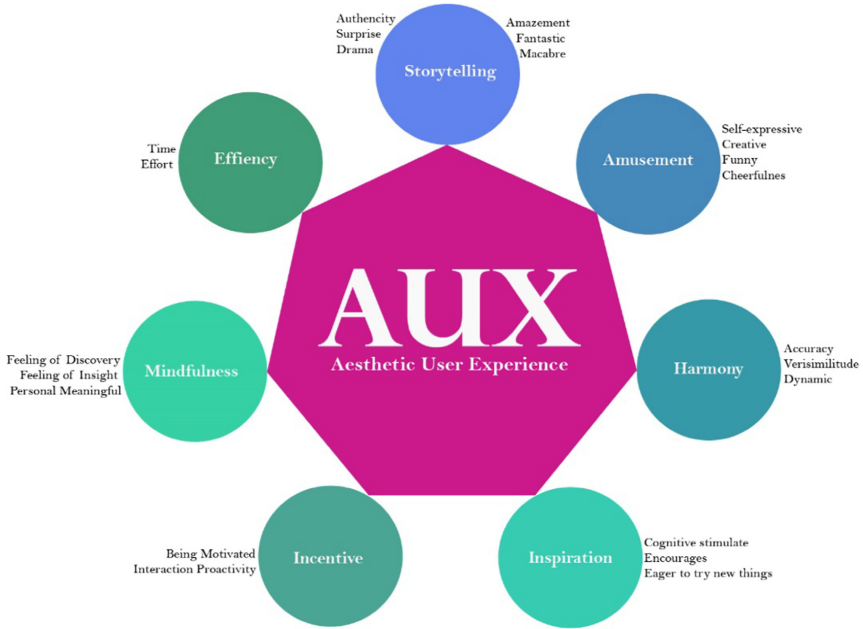


Fig. 3. The heptagon of AUX model

### 4.3 Harmony

Harmony in the AUX model encompasses the aesthetic and user experience of the aesthetic objects and HCI products. It requires precision from a technical point of view and emotional experience so that the beholder feels something is true and verisimilitude. In addition, it can also implement products that are not static but more dynamic.

### 4.4 Inspiration

Among the important constructs in AX and UX are cognitive. It plays a big role in stimulating knowledge with existing knowledge and previous experience. It can also be a medium to encourage and shove for the beholder eager to try new things.

### 4.5 Incentive

The incentive is a construct that aims to inspire always to be motivated. The combination of AUX with the device and the aesthetics of the product provides an experience of interaction with the activities offered, giving positive encouragement to the aesthetic object.

### 4.6 Mindfulness

Mindfulness is an awareness of the need to explore and experience with aesthetic devices and objects. That being so, the beholder will be able to feel of insight and at the same time, grow an experience termed personal meaningful.

## 4.7 Efficiency

Undeniably attainment of something efficiently time and effort is an important thing as its main goal. In the context of the AUX model, the beholder's experience with AUX products is related to time and effort.

## 5 Conclusion

In conclusion, the heptagon of AUX model (Hepta AUX) is a combined model between AX and UX theories for technology-based arts application. It can be used as a guideline for the development and evaluation not only for AR comics but other technology-based arts applications such as digital art installation and VR poster. According to previous studies, most products from mix-reality applications that apply art elements use a lot of UX model while most art objects that apply mix-reality technology only use AX to translate the results of the product. Furthermore, the significant contribution of the Hepta AUX model is that it bridging the two major theories that are different in terms of discipline and body of knowledge, namely AX and UX to be synergised, thus enable to establish an accurate empirical measurement of commonly neglected area that is technology-based arts application.

## References

1. Hagman, H.: Aesthetic Experience Beauty, Creativity, and the Search for the Ideal. *Contemporary Psychoanalytic Studies* (2005)
2. Perlovsky, L.: Mystery in experimental psychology, how to measure aesthetic emotions? *Front. Psychol.* **5**, 1006 (2014)
3. Moens, B.G.: Aesthetic experience in virtual museums: a post phenomenological perspective. *Stud. Digital Herit.* **2**, 1 (2018)
4. Schoeller, F., Perlovsky, L.: Aesthetic chills: knowledge-acquisition, meaning-making, and aesthetic emotions. *Front. Psychol.* **7**, 1093 (2016). <https://doi.org/10.3389/fpsyg.201601093>
5. Savaş, E.B., Verwijmeren, T., van Lier, R.: Aesthetic experience and creativity in interactive art. *Art Percept.* **9**(2), 167–198 (2021)
6. Pelowski, M.: Tears and transformation: feeling like crying as an indicator of Insightful or “aesthetic” experience with art. *Front. Psychol.* **6**, 1006 (2015). <https://doi.org/10.3389/fpsyg.2015.01006>
7. Docherty, T.: Aesthetic Education and the Demise of Experience. Manchester University Press, In *The new aestheticism* (2018)
8. Schindler, I., et al.: Measuring aesthetic emotions: a review of the literature and a new assessment tool. *PLoS ONE* **12**(6), e0178899 (2017)
9. Al-Azzawi, A.: Experience with Technology: Dynamics of User Experience with Mobile Media Devices. Springer Science & Business Media (2013). <https://doi.org/10.1007/978-1-4471-5397-9>
10. Thielsch, M.T., Thielsch, C.: Depressive symptoms and web user experience. *Peer J* **6**, e4439 (2018)
11. Hassenzahl, M.: The hedonic/pragmatic model of user experience. *Towards a UX manifesto* 10 (2007)

12. Ritsos, P.D., Ritsos, D.P., Gougoulis, A.S.: Standards for augmented reality: a user experience perspective. In: International AR Standards Meeting, pp. 1–9 (2011)
13. Qing-Xing, Q., Zhang, L., Chao, W.-Y., Duffy, V.: User experience design based on eye-tracking technology: a case study on smartphone APPs. In: Duffy, V.G. (ed.) *Advances in applied digital human modeling and simulation*, pp. 303–315. Springer International Publishing, Cham (2017). [https://doi.org/10.1007/978-3-319-41627-4\\_27](https://doi.org/10.1007/978-3-319-41627-4_27)
14. Klingbeil, M., Pasewaldt, S., Semmo, A., Döllner, J.: Challenges in user experience design of image filtering apps. In: SIGGRAPH Asia 2017 Mobile Graphics & Interactive Applications, 22. ACM. (2017)
15. Olsson, T., Lagerstam, E., Kärkkäinen, T., Väänänen-Vainio-Mattila, K.: Expected user experience of mobile augmented reality services: a user study in the context of shopping centres. *Pers. Ubiquit. Comput.* **17**(2), 287–304 (2011). <https://doi.org/10.1007/s00779-011-0494-x>
16. Speicher, M., Hall, B.D., Nebeling, M.: What is mixed reality? In: Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems, ACM (2019)
17. Hamacher, A., Hafeez, J., Cszmazia, R., Whangbo, T.K.: Augmented reality user interface evaluation – performance measurement of hololens, moverio and mouse input. *Int. J. Inter. Mob. Technol. (iJIM)* **13**(03), 95 (2019). <https://doi.org/10.3991/ijim.v13i03.10226>
18. Cabero Almenara, J., Barroso, J.: The educational possibilities of augmented reality. *New Appr. Educ. Res.* **5**(1) (2016)
19. Larsen, R.R., Sackris, D.: *Feeling the Aesthetic: A Pluralist Sentimentalist Theory of Aesthetic Experience* (2020)
20. Marques, D.: Augmented reality: the new kid on the block. *J. Nat. Sci. Illust.* **49**(3), 12–14 (2017)
21. Azuma, R., Baillot, Y., Behringer, R., Feiner, S., Julier, S., MacIntyre, B.: Recent advances in augmented reality. *IEEE Comput. Graphics Appl.* **21**(6), 34–47 (2001)
22. Smith, C.: Motion comics: the emergence of a hybrid medium. *Writ. Vis. Cult.* **7**, 1–23 (2015)
23. Vassiliadi, M., Sylaiou, S., Papagiannakis, G.: Literary myths in mixed reality. *Front. Digit. Humanit.* **5**, 21 (2018). <https://doi.org/10.3389/fdigh.2018.00021>
24. Clayton, M.J.: Delphi: a technique to harness expert opinion for critical decision-making tasks in education. *Educ. Psychol.* **17**(4), 373–384 (1997)
25. Ayub, E., Mohamad, S.N.A., Wei, G.W., Luaran, J.: A learning design strategy framework for content transformation using fuzzy delphi method. *Int. J. Inf. Educat. Technol.* **10**(12), 882–888 (2020)
26. Irshad, S., Awang Rambli, D.R.: Multi-layered mobile augmented reality framework for positive user experience. In: Proceedings of the 2nd International Conference in HCI and UX Indonesia 2016, pp. 21–26. ACM (2016)
27. Redies, C.: Combining universal beauty and cultural context in a unifying model of visual aesthetic experience. *Front. Hum. Neurosci.* **9**, 218 (2015). <https://doi.org/10.3389/fnhum.2015.00218>
28. Leder, H., Belke, B., Oeberst, O., Augustin, D.: A model of aesthetic appreciation and aesthetic judgements. *Br. J. Psychol.* **95**, 489–508 (2004)
29. Markovic, S.: Components of aesthetic experience: aesthetic fascination, aesthetic appraisal, and aesthetic emotion. *i-Perception* **3**(1), 1–17 (2012). <https://doi.org/10.1068/i0450aap>
30. Morreall, J.: *Comic Relief*. Wiley-Blackwell, Oxford, UK (2009). <https://doi.org/10.1002/9781444307795>
31. Klaehn, J.: The craft of comics: an interview with comic book artists Norm Breyfogle. *J. Grap. Novels Com.* **6**(1), 108–115 (2015). <https://doi.org/10.1080/21504857.2014.943414>
32. Plutchik, R.: A general psychoevolutionary theory of emotion. In: *Theories of Emotion*, pp. 3–33. Academic press (1980)
33. Parrot, W.: *Emotions in Social Psychology*. Psychology Press, Philadelphia (2001)

34. Jamil, M.R.M., Said, S., Azeez, M.I.K.: Kopetensi guru terhadap pengurusan pengajaran dan pembelajaran: suatu pendekatan kaedah fuzzy Delphi. *Jurnal kepimpinan pendidikan* **1**(3), 77–88 (2014)
35. Manakandan, S.K., Rosnah, I., Mohd, J.R., Priya, R.: Pesticide applicators questionnaire content validation: a fuzzy Delphi method. *Med. J. Malaysia* **72**(4), 228–235 (2017)