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**Kansei design model for engagement in online learning: A proposed model**

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### Abstract

Positive user experience is associated with positive emotion which is important to engage students in online learning. Most of the previous studies focused only in one element when studying the user experience for example elements in the interface design only or in the interaction design only. This research proposed a model with the combination of design elements in the interface, content and interaction design to understand the experience specifically the students' engagement with the online learning material. The proposed model of students' engagement is based on the principles of Aptum model and interaction design. As the dimensions in the model is general, therefore to extract the details of the design elements, the Kansei Engineering technique is adopted as it has been proven able to extract the design elements in many areas of studies. This paper described the proposed model and explained the main design elements in interface, content and interaction design dimensions. Discussions on user experience, emotion and engagement in learning, a brief explanation about Kansei Engineering technique and some conclusion about the research are also presented. © 2011 Springer-Verlag.

### Author Keywords

Aptum Model; E-Learning Material; Emotion; Engagement; Kansei Engineering; Online Learning; User Experience

### Index Keywords

E-Learning Material, Emotion, Engagement, Kansei Engineering, Online learning, User experience; E-learning, Information science, Interfaces (materials), Students, User interfaces; Design

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# Kansei Design Model for Engagement in Online Learning: A Proposed Model

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**Abstract.** Positive user experience is associated with positive emotion which is important to engage students in online learning. Most of the previous studies focused only in one element when studying the user experience for example elements in the interface design only or in the interaction design only. This research proposed a model with the combination of design elements in the interface, content and interaction design to understand the experience specifically the students' engagement with the online learning material. The proposed model of students' engagement is based on the principles of Aptum model and interaction design. As the dimensions in the model is general, therefore to extract the details of the design elements, the Kansei Engineering technique is adopted as it has been proven able to extract the design elements in many areas of studies. This paper described the proposed model and explained the main design elements in interface, content and interaction design dimensions. Discussions on user experience, emotion and engagement in learning, a brief explanation about Kansei Engineering technique and some conclusion about the research are also presented.

**Keywords:** User Experience, Kansei Engineering, Emotion, Engagement, E-Learning Material, Aptum Model, Online Learning

## 1 Introduction

There are some concerning issues for higher levels of learning. For example [1] stated that there is a need to quickly identify and support the at risk students. In addition, [2] stated that there is a need "to study the qualitative nature of online interaction in terms of teaching and learning approaches". [2] also suggested that there is a need to further investigate in order to understand the nature of online learning especially for higher levels of learning. A good online learning system might be helpful to not only of the at risk students but also to other students as a way to enhance their learning capabilities.

How to tailor towards the need of having a good online learning experience especially for higher levels of learning?

User experience is one of the important elements in learning. Reference [3] emphasized that “users’ experience of their interaction with computers and interactive systems is becoming increasingly important”. In addition, according to Zaharias and Poylymenakou, affective and emotional aspects of interaction are important components in order to understand better the user experience [4]. Furthermore, [5] also stressed on the emotional aspect of the learners and the learning experience they are going through. According to them a good e-learning system “would facilitate an experience with the learner that creates emotional tags, thus enhancing the ability to learn from that experience” [5]. [6] also emphasized that there is not yet any tool to measure emotional experience in the interaction with websites.

References [7] and [8] argued that “user’s emotional responses to an interface performance, ways of interaction and content can be modeled, evaluated and supported”. Therefore how to measure the user experience or emotional experience especially in learning? Usability metrics alone might not be able to accurately measure the user experience [9, 10]. In their study they have demonstrated that the usability metrics of time on task and number of errors alone would not sufficiently measure the overall user experience of the product or interfaces. According to their research emotional responses could also play a significant role to measure the user experience as well as to judge the usability of the product or interfaces. This is further supported by [8] stated that there are more usability issues in human-computer interaction (HCI) and the role of emotions in interaction is “simplified or ignored”. In addition [10] stated that there are many researchers who stated the importance of emotion in user performance as well as user experience.

[11] also noted that some people stay longer in front of one painting but only in a short while in front of the others even though the two paintings are alike. The question posed is what makes “one experience so compelling and the other barely noticeable” [11]. In the same direction in online learning, what makes one learner engaged in an online learning material and be able to absorb and learn efficiently in the online learning material as compared to the others? What are the elements that contributed to the students’ experience and engagement in the online learning material?

Some problems in online learning are related to the online learning material as have been highlighted by previous researchers. Fredskild (2008) (as cited in [12]) highlighted the fact that “some of the e-learning courses are poorly designed with little attention to pedagogical aspect, less user interaction and low quality course material design”. In addition, Schaik and Ling also emphasized that poorly designed pages could rapidly turn users away [13].

Furthermore according to [14], currently there is a discrepancy between the designs of e-learning and the learners’ need or preferences resulting in poor learning among students. This is further supported by [15] that the designers should employ the principles of user or learner centered design. Even though there are many e-learning materials which employ multimedia elements as well as interactivity but still this does not meet the expectation of the user (Greitzer, 2002) as cited in [15]. The root might be because of the poor design, organization of the content as well as usability. Accordingly, previous researchers also noted the difficulty to design the online

learning interfaces as compared to the design of web pages as stated by Kreijns et al (2002) as cited in [16].

Reference [17] also added some argument to the poor design problem such as “a Web interface that is boring, a multimedia presentation that does not captivate users’ attention ....are quickly dismissed with a simple mouse click”. O’Brien and Tom also highlighted that it is important to engage users in a web site as failing to do so might lead to information not being transferred. Further they emphasized that in order for technologies to be successful they must not only usable but they should engage users as well.

From previous researches it is evidenced that a good design is important in online learning. Furthermore, a good design might influence the experience of the learners thus promotes engagement of the learners in learning the online material.

This paper is organized in the following order; it starts off with an introduction, followed by some discussions on users’ experience, emotion and engagement, then followed by the proposal of the model with some discussions of each of the dimensions, and lastly the conclusion of the research.

## **2 User Experience, Emotion and Engagement**

According to [3] the principle of “what is beautiful is usable” is still not confirmed and they suggested that more research should be conducted relating to the principles and factors behind in other products. Accordingly, these authors also noted that user experience is increasingly known in the HCI field and one important aspects of research in this area is the process where users formed aesthetic and other judgment of the interactive products. To attract the users’ attention, the attractiveness of the first page of the web site plays an important role as highlighted by [18]. Within 50 ms the attractiveness of the website will be judged by the users. In addition, [3] also noted that, [19] proposed that by following the “immediate positive judgment” of the first page, users would further make “positive initial deliberate judgment” usually within 10 seconds. However [3] argued on three important things mentioned in previous studies. The studies did not present a context of use, did not include a test of users’ use of web sites and did not examine their perceptions after use. The studies carried out by [18] and [19] also linked to a wide range of unrelated domains. The issue is as to whether the statement will be the same if the domains are related.

### **2.1 User Experience**

Reference [20] defined user experience as “the experience the product creates for the people who use it in the real world”. He also added that in term of product design most people only think about the “aesthetic appeal” and “functional terms”. The aesthetic appeal is “a well-designed product that looks good to the eye and feels good to the touch”. Meanwhile the functional terms is “a well designed product that does what it promises to do”. He further argued that these elements would “certainly be failures of design”. When aiming to design a product for users’ experience, Garrett claimed that the designer should be looking beyond the functional or aesthetic terms.

On the other hand [21] argued that user experience compound of three basic elements. The elements are perception of instrumental qualities, perception of non-instrumental qualities and user emotional responses to system behavior. The study also supported the notion of user experience as a compound of emotions and perceptions of instrumental and non-instrumental qualities in the proposed Component of User Experience Model (CUE-Model). The perception of instrumental qualities is related to usability and usefulness of a system. The perception of non-instrumental qualities is related to appeal or attractiveness. The perception of instrumental qualities and perception of non-instrumental qualities might affect the emotional reaction of user, be it happy, sad, surprise or others.

In the same direction, Lokman (2011) also observed that affective qualities are also an important component in user experience which comprises the functional and non-functional qualities. The functional qualities are for example usability, usefulness and accessibility while non-functional qualities are aesthetic, symbolic, motivational and others [22]. In addition, she also stressed on the aspect of affective qualities which comprise of subjective feelings, physiological reaction, cognitive appraisal and behavior tendency from users. The affective qualities include both of the components of functional and non-functional qualities.

In another definition of user experience, [23] stated “the degree of positive or negative emotions that can be experienced by a specific user in a specific context during and after product use and that motivates for further usage”. From this definition it is evidenced that user experience also involves the emotions of the users and thus emotions plays important role in user experience. However, in this definition one could argue that, if it is positive emotion experienced by the users then it could motivate the users for further usage of the product or services they experiencing. If it is of a negative emotion, then consequently, it will demotivate the users from further using the product or services.

From these previous studies, it is obvious that user experience has always includes the effect on emotion or affect, visual appealing, and usability. Thus the importance of this study lies on the affect or emotion particularly in this research it is focusing on the emotional experience of the learners in online learning.

## **2.2 Emotion in Learning**

Reference [5] emphasized on the importance of emotion in association with learning or online learning. They stated that:

“Understanding and harnessing the power of emotion can improve an individual’s ability to learn.... A passion to learn or a deep passion related to the content of learning embeds strong emotional tags with what is being learned ... When positive emotions create this impact, learning becomes exciting and the memory of what is learned stays with us. Memory is further enhanced when learning includes meaning and understanding of the material.” page 210.

According to [24], positive emotion can be associated with positive in learning. Reference [24] emphasized that “positive emotion can pave the way for memory and higher order thought”. Recent brain research also indicates that emotions is essential in learning [25]. In order for learning to take place the attention of the learners must

be engaged first and emotional responses could “trigger” the learners’ attention [25]. In addition, Jensen (1998), as cited in [26] also revealed that “emotions drive attention, meaning and memory and critical to patterning in the brain”.

Reference [27] also emphasized that students will not learn very well if they have negative emotions. In addition, they also affirmed that emotion also plays important role to motivate student.

Emotional issues cannot be ignored and should be included in all types of learning and more research is needed in this area [25]. In addition, [28] also highlighted the importance of studying emotions especially in the context of student’s engagement and learning.

From previous researches, it can be concluded that emotion plays an important role to attract the attention of the learner as being emphasized by [26] and [25]. When the attention of the learner is captured then engagement will take place and learning will be much easier.

### **2.3 Engagement in Learning**

Reference [29] study in detail the engagement based on four main application areas; in online shopping, educational web-casting, web searching and video games. They also highlighted that “poor web site design and usability maybe useful for predicting potential barriers to engagement” page 941. Furthermore, it would be benefit to further research in order to better understand on how to design for system engagement based on distinct motivations especially in interactive searching, browsing and learning systems [30]. Engagement is defined as “a quality of user experience” which have six factors such as focused attention, perceived usability, durability, novelty, aesthetics and felt involvement [30].

[31] stated that one could believed that to enhance student’s learning experience learner-centered and collaborative activities should be employed rather than lecture-based or instructor-based pedagogy. It was also highlighted that Corno and Mandinach (1983) who were the first to define and examine student cognitive engagement, have proposed that student engagement can be observed when “students’ demonstrated prolonged attention to a mentally challenging task, resulting in authentic learning and increased levels of higher order thinking” [31].

Previous studies showed that computers and information technology plays a positive role to support student engagement [32]. Based on previous research, “online learning can stimulate students to use higher order skills such as problem solving, collaboration, and stimulation” but it is still “unclear if the students learn more in online courses” [32]. This therefore, demanded more research on how learning is related to the design of the online learning material to promote engagement and later resulted in positive learning experiences.

On the other hand, [33] stated that there is a recent research in order to understand the effect of emotions towards student engagement and achievement. The research focused on the study of the engagement of students in science based on factors such as positive emotion of enjoyment in combination with other variables such as interest, embedded interest, science knowledge, personal value of science and others. The students’ interest in learning science mediated the effect of enjoyment of science on

embedded interest (“student’s expression of their desire to engage further with topics they had been working on”). Therefore it can be concluded that positive emotion is important to engage the learners.

In addition, while many researches has been conducted in the area of multiuser environment to estimate user attention, less research try to estimates the user attention or engagement in HCI environment [34].

In terms of defining the type of engagement based on previous research, [35] have defined engagement in three ways based on the work of Fredricks, Blumenfeld and Paris (2004) namely the behavioral engagement, emotional engagement and cognitive engagement. Behavioral engagement is based on students’ participation which “includes involvement in academic and on task behavior”. While emotional engagement relates to “student attitudes, interest and values”, the cognitive engagement is more towards “motivational goals and self-regulated learning”. It was also highlighted that “positive engagement in learning is therefore a cognitive-affective condition in which students want to learn”. Previous researches have demonstrated that students’ engagement strongly influenced academic achievement [35]. Other types of engagement as defined by previous researchers are depicted in Table 1 below.

**Table 1.** The type of engagement discussed by previous researchers.

Engagement Type	[35]	[36]	[37]
Behavioral	√	√	√
Psychological (Emotional)	√	√	√
Cognitive	√	√	√
Social-behavioral		√	
Academic			√

There is less research in the emotional engagement and cognitive engagement as it is quite abstract and therefore difficult to measure [37]. In another domain, such as in online consumer experience, [38] defined online engagement as “a cognitive and affective commitment to an active relationship with the brand as personified by the website or other computer-mediated entities designed to communicate brand value”. Online engagement “must incorporate the satisfying of instrumental value (utility and relevance) and experiential value (emotional congruence)” [38].

[39] stated that engagement is one of the “indicators of students’ motivation”. Attractive design according to them plays important role to motivate the student as well adding the multimedia features and game activities. On the other hand [35] stated that engagement is a bigger concept than motivation to learn. They also noted that engagement and motivation might overlap with each other.

While most studies relate engagement to the student physical behavioral, there is less research in understanding the effect of the design of learning material to students’ engagement especially in higher education. Therefore, this study tries to argue that a good design of online learning material will have a positive influence on the students’ engagement.

### 3 Proposed Model

In this section, the researchers described the model that is proposed for this research. The aim of the research is to elicit the design elements that are related to emotional engagement in online learning. There are two important questions posed. The first one is what are the dimensions or constructs or design elements that evoke the learners' emotion? Secondly, do the dimensions or constructs or design elements able to engage the learners in online learning environment and stimulate the learning experience?

A few models and theories were evaluated. The theories and model that has been evaluated are the Flow theory by Csikszentmihalyi [40], Engagement theory by Kearsley and Schneiderman [41], OCC (Ortony, Clore & Collins, 1988) model [42, 43, 44], and Aptum model [47]. Based on these theories, it is understood that the engagement is related more towards the user action or behavior, and there are no possible dimensions or construct to identify what makes the elements induced emotion or engagement. On the other hand, even though the OCC model is related to emotion, the importance of the model is on the ability to deduce emotions from action, and not to identify the elements or dimension that evoke the emotions.

After evaluating relevant theories and models, the selected model is based on the principles of Aptum model. Aptum model was being considered as it consists of the elements that are strongly proposed for effective communication and more importantly, it is also associated with emotion. The Aptum model lay out the important elements for an effective communication to take place such as interface, content and others as this paper argues that instructors communicate knowledge to their students via good communication to make sure the student understand the concept behind it. Not only that, Aptum model also identifies emotion as one of the important elements in persuasive communication. Other models and theories do not give any hints to the elements of effective communication.

Aptum model is a general model. In order to get to the specific design elements, the Kansei Engineering (KE) technique is being employed so as to extract the combination of the elements that show the effect on emotional experience in the learning of the material in online environment. KE has been around for 40 years since 1970. The founder of KE is Professor Mitsuo Nagamachi. From previous researches, KE is a proven technique to extract the design elements in many areas such as manufacturing, entertainment and others. The application of KE in education, however, is still at its infancy [12]. In this paper, KE technique would not be explained in detail. For further reading please refer to [45, 46].

Therefore, based on the principles of Aptum model, this paper argues that there is not only one element affecting the positive emotional experience in online learning, but is the combination of many elements that affecting the positive emotional experience in online learning.

Aptum model, according to Hasle (2006), was based on the concepts found in Aristotle's Rhetoric and further developed by Cicero. Even though the Aptum model is for persuasive effect it is however related to emotion. "The idea that a communication is there not just to inform and to achieve a goal but also to create as much pleasure, or joy, as possible is very characteristic of Rhetoric" [47]. Thus, this model also involved emotional value. In addition, according to Garrett (2011),



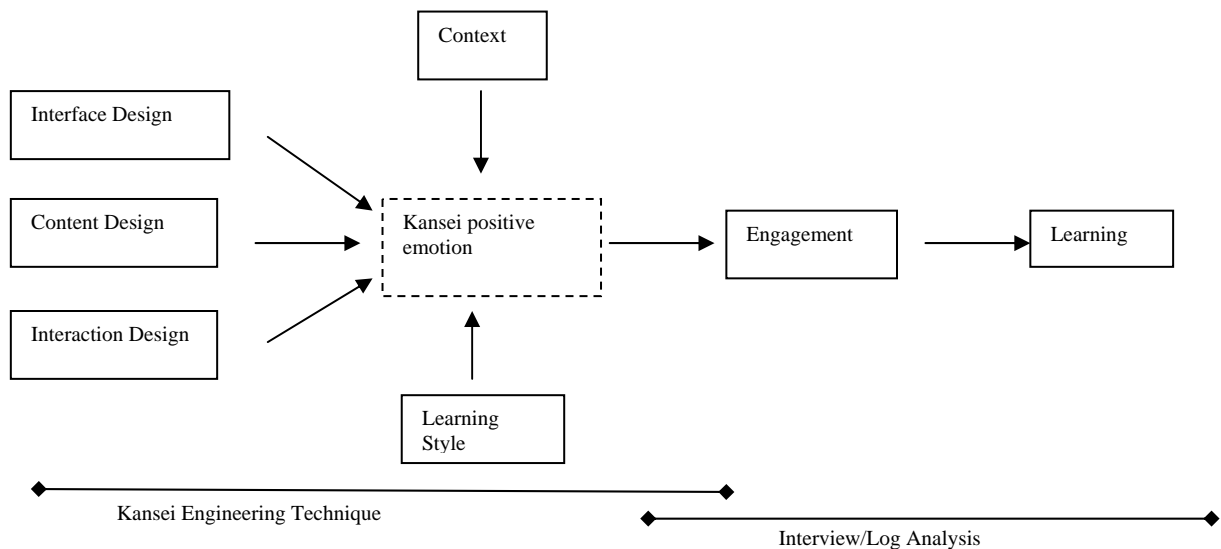
“effective communication is a key factor in the success of your product” when referring to the communication in the web site [20].

There are five elements in the Aptum model. It is the Orator (the speaker or sender), the Scena (the audience or hearer or receiver), the Res (the subject matter or the content), the Verba (the style, choice and deployment or the form of presentation) and the Situatio (the circumstances surrounding the presentation or the context). The model stresses on the importance of the balance among the elements to achieve the apt. The more the balance is, the better the apt.

The strength of Aptum model is also similar to the work by Morville and Rosenfeld’s Information Architecture Iceberg [47]. In comparing the model with the architecture, [47] stressed on the importance of the users, content, context and interface which is similar to the Aptum model such as *scena*, *res*, *situatio*, and *verba* respectively.

[3] in their study on the role of context (the *Situatio*) or define as mode of use, in perceptions of the aesthetics of web pages over time indicated that the following factors are important elements in studying the user perception of web sites, namely context (the mode of use), aesthetic design, and experience of using a product. Among of the three elements, the context is a very critical factor which could influence the user’s perceptions and must then be “explicitly addressed” in the study of users’ experience [3]. In accordance to this, this research tries to identify whether this is true in the online learning with a specified course.

Even though other researchers have highlighted many different ways to deal with emotions and online learning, to the best of the authors’ knowledge, research that combines the elements of balance among interface design, interaction design and content design with KE technique is still lacking. Fig. 1 depicts the proposed model.



**Fig. 1.** The proposed model: Kansei Design Model for Engagement in Online Learning (KDM-EOL).

The interaction design is added since the literature has proven it as to be an important element in learning whereby interaction happens between the material and the learner. There are more discussions on the interface, content and interaction design in the following sections.

### **3.1 Interface Design (The *Verba*)**

Reference [11] described aesthetics as “something to do with pleasure and harmony which human beings are capable of experiencing”. In addition [11] also highlighted pleasant experience with emotion by stating; “to the extent that aesthetics is a pleasant experience or an experience that leads to pleasure, it implies a relationship to emotion”. It is important to include visual appeals that usually demonstrate aesthetic value. The visual appeal for learning material is related to the interface of online learning. Does the visual appeal also important in online learning?

In addition, while emphasis is being put on the importance of the aesthetics of the web page design, [13] stressed that this area still need further investigation especially in the empirical investigation. Citing Hoffman and Krauss (2004), [13] emphasized on the visual impact of a web page which may have a significant role in user experience as well as for effective communications.

In order to understand better the important design elements in the interface, the design elements that are being studied by other researchers is being evaluated. As there is a limited space for discussion therefore the authors only provide the summary of some of the design elements for interface discussed by previous researchers.

In short, most of the interface design elements from past studies are the quality of visual aesthetic, graphic, text, text color, background color, color combination and immersion of the interface, layout, column width, image placement, empty spaces, sound, animation, headings, body text, contrast, background, hyperlinks, banners, navigation, multimedia, toolbars and icons ([48], [49], [50], [51], [52], [53],[13],[16] [54], [55]).

### **3.2 Content Design (The *Res*)**

Kushnir (2004) and Hiltz and Turoff (1985) as cited in [56] gave similar opinion that “overly busy e-learning environments that contain irrelevant information, are over-stimulating, distracting and can “clog up” valuable (cognitive) processing resources” and “when e-learning environments contain unorganized information, students find it difficult to decipher the relevance of information, and thus feel overloaded”. This shows the importance of organization of information in online learning environment so as to improve the student learning ability.

Other researchers have also stressed on the importance of content such as Rachel Lovinger as cited in [57] who said: “The main goal of content strategy is to use words and data to create unambiguous content that supports meaningful, interactive, experiences”.

Garrett also highlighted the importance of content: “If the sites consists mainly content or information, the main goal is to communicate that information as effectively as possible. It is not enough just to put it out there. It has to be presented in a way that helps people absorb it and understand it” [20]. It was also noted that “Content is the king” on the Web. The most important thing most website can offer is content that users find valuable. Garrett further argued that users usually do not visit websites just because of “the joy of navigation”. Instead the content also has important roles to attract the user.

The summary of the content design elements from the past literature includes problem and exercise, animations, story based instruction, interactivity, text based, figures, games, sound based, situated game-based and combinations of different content form such as text only, text and picture, animation only, picture and text and animation, and animation and text, game based learning, real case study, example first and then concept, quiz and exercise with automatic feedback, picture, graph, diagram, animation, video clips, 3D demo, interactive visual tools, visual material in test or exercises, self assessment in exercise, real case analysis, forum newsgroup, easy to difficult material, audio format, outline or summarize materials and take notes using online tools ([58], [59], [60], [14]). In addition, some of the researchers also form different combinations of the elements in order to identify the best combination to understand the content.

### **3.3 Interaction Design**

Reference [61] stated that from previous literature there is little agreement among the researchers between the meaning of “interaction” and “interactive”. [61] defined interaction as “a process in which the “actions” executed by learners and their learning environment are mutually dependent on each other”. They further emphasized that even though the interactivity involved “overt” action, most of the researchers agreed that it is not the action that cultivate learning but actually the “cognitive process” that resulted from the interactivity.

Bransford et al (1999) as cited in [62] suggested that “Interactivity makes it easy for students to revisit specific parts of the environments to explore them more fully, to test ideas and to receive feedback”. They also added that non-interactive environment is less effective for students’ learning in terms of the ability to “explore and reexamine” the materials.

The effect of interactivity on students learning still yields different result. According to [62] there is still some who claimed there is the advantages of interactivity, while others claimed mixed results of interactivity. Others also claimed there is some drawbacks of interactivity [61, 62]. Therefore it can be argued that there is still room for more research in this area. Especially in order to recognize which element of interactivity helps in student learning, and which is not.

Other than that Renkl and Atkinson (2007) as cited in [62] commented that “Interactive learning environments are viewed as a promising option not merely for presenting information but for allowing the learner to engage actively in the learning process”. According to [62] the meaning of interactivity could be very different from one researcher to another researcher. [63] also stressed the importance of

interactivity in online learning experience as from previous researches it is one of the most crucial factors in contributing to the quality and success of online learning.

Williams et al, 1988 as cited in [63] claimed that, interactivity is one of the important factors for successful online learning experiences. There are a few definitions of interactivity highlighted in their study. Based on other researchers' definitions, they also concluded that "interactivity refers to those functions or operations that are available to the users and that enable them to work with content presented in a computer-mediated environment and receive feedback".

According to [63], there are five interaction types in a learner-centered Course Management System (CMS), namely learner-learner interaction, learner-instructor interaction, learner-interface interaction, learner-self interaction, learner-content interaction. For the purpose of this research, the focus would only be on the of learner-content interaction types. Based on the findings, they indicated that the adoption rate of the learner-learner was the highest, and the last one was learner-content type. The result of poor adoption rates in the learner-content interaction might indicate that less learner-content interactive functions were being incorporated in the CMSs.

The summary of the elements of interaction discussed by previous researchers include games-based learning [64]; dialoging, controlling, manipulating, searching, navigating with multiple presentation mode; sequencing, controlling contents and representation format in hypermedia environment; pacing of a video-based model; predicting, reacting to reflection or self explanation prompts in example-based environments, problem solving with intelligent tutorial assistance [61]; links to related educational systems, links to related learning materials, multimedia presentation, push media, online quiz, online exam, study guide, FAQ, online help, content-difficulty detection, individualized learning record, individualized instruction, individualized test/quiz, materials-viewed tracking, note-taking, learner contribution to learning materials, sweepstakes, educational games, jokes [63]; multimedia learning, video, CBI [62].

Other related interaction design elements that have been recently researched on engaging learners or capturing the learners' attention are related to virtual human ([65], [67], [27]), agents and avatar ([66], [69]) and animation and visual cueing [70]. Even though there are many studies conducted using the virtual human, avatar and agent, still there are mixed results on the effectiveness towards students' learning. Some stated positive results [27, 68] and others, despite of some positive outcomes, still reported some drawbacks [65-67, 70]

## **4 Conclusion**

Based on the review of the literature and the review of some related models and theories, a proposed model was developed to promote students' engagement in the online learning through the learning material. The proposed model was based on the principles of Aptum model, which combined the elements of interface, content and context. Additionally, the element of interaction is also added as it is perceived important in the learning environment. In order to extract the design elements, Kansei

Engineering technique is adopted, giving the name to the proposed model - Kansei Design Model for Engagement in Online Learning (KDM-EOL). The proposed model is hoped to act as a guideline for the designer to design an emotionally engaged online learning material to help in promoting positive learning experience in order to foster learning.

Future research will be conducted to confirm the proposed model by extracting the design elements using the Kansei Engineering technique, performing some analysis using the log records as well as conducting interview with the students.

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