Positive Engagement Evaluation Model for Interactive and Mobile Technologies

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Abstract - *Interactive technologies and applications are pushing the boundaries of traditional user experience (UX) design, development, and testing. Users are mobile and actively interact with content across multiple media and technologies. On the content producer side, the trend toward collaborative, transmedia narrative-based properties unfolding over time and multiple devices, challenges the utility of domain or technology-specific evaluation frameworks. As user expectations rise and multi-device applications become more complex, traditional and singularly-focused usability and functionality testing provides insufficient requirements to create user engagement. This paper introduces the Positive Engagement Evaluation Model (PEEM), designed to incorporate qualitative experience in interactive and mobile applications. To identify the core drivers of user experience, the PEEM integrates current findings in neuroscience, cognition, and perception with theories of optimal engagement, flow, narrative transportation, persuasion, and motivation. Currently in pilot testing, this model incorporates a decision-tree and evaluation matrix that distinguishes between the critical differences of task-based and narrative-based applications. This paper discusses the theoretical development of the model and the task-based matrix, the first of the two evaluation matrices in development. The matrix presents evaluation criteria framed from both the designer/developer and user perspectives. Our goal is to provide developers, designers, and producers with a customizable tool based on current findings across the social sciences and neurosciences, to guide decisions and iterative processes of testing and development. Limitations and implications for further research are discussed.*

Keywords: flow, user experience, evaluation matrix, optimal engagement

1 Introduction

Interactive technologies in immersive and mobile applications are pushing the boundaries of traditional user experience (UX) design, development, and testing. Users are no longer confined to a single device, application or geographic location. They are mobile and actively interact with content across multiple media and technologies. On the content producer side, the burgeoning trend of transmedia narrative-based properties, where intentionally created narratives trigger knowledge creation and interpretation in users over time and multiple devices, challenges the utility of domain or technology-specific evaluation frameworks. Sophisticated and innovative technologies and applications are changing user expectations, creating a rising demand for technologies where traditional and singularly-focused usability and functionality testing are insufficient requirements to create user engagement. In this new environment, the need to shift UX beyond functional usability to a holistic, multi-dimensional assessment that incorporates qualitative experience and a deep understanding of the psychological aspects of optimum user experience is an imperative for successful products.

Successful UX invites individuals to engage by facilitating psychological immersion and an experience of presence in a mediated experience. The increasingly frequent inclusion of rich multi-device content with augmented and hybrid reality interactions are an indication of the trend towards immersive, transmedia experiences that are challenging developers to create a seamless experience for users across platforms and devices. Sustainable positive engagement comes from tapping into critical psychological domains. Product developers need a way to recognize and incorporate these fundamentals in order to make judgments about which novel, innovative, and creative content and affordances can enhance the holistic user experience and identify those which can detract.

This paper introduces the Positive Engagement Evaluation Model (PEEM) designed to incorporate holistic, qualitative experience in interactive and mobile applications. To identify the core drivers of user experience, the PEEM integrates current findings in neuroscience, cognition, and perception with theories of optimal engagement, flow, narrative transportation, persuasion, and motivation. Currently in pilot testing, this model incorporates a decision-tree and evaluation matrices that distinguish between the critical differences of task-based and narrative-based applications. It was developed to integrate theories and heuristics at a fundamental level to bridge the theoretical and functional silos in the fields of HCI, UX, gaming, interactive media, and ubiquitous computing. PEEM is a framework to evaluate the potential for immersion and engagement in *and across* new technologies. This model is proposed so that developers and producers can shift from a technology-focused paradigm to a more user-centric approach for optimal engagement recognizing the increasing fluidity and

complexity of the media and technology landscape. PEEM will also enable developers to evaluate media and technology experience based on core domains that integrate conscious and subconscious processing and control attention, flow, engagement, enjoyment, and social connection. This new level of UX design and measurement will help ensure product designers and developers will have maximum user engagement in this increasingly complex mode of interaction.

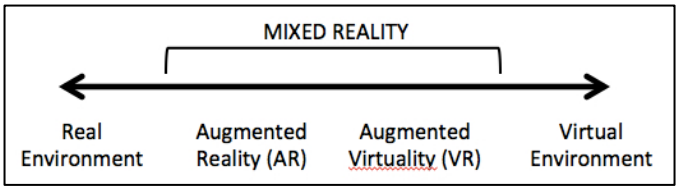
2 The evolution of user experience

User experience (UX) is a broad topic and has been used as an umbrella term for a wide variety of human-technology interactions [1]. Human-computer interaction (HCI) research has been based in theories and applications of cognitive psychology and the science of human factors, engineering, and computer science [2]. Norman initially popularized the term 'user experience' to emphasize that user experience involves much more than efficiency and conventional understandings of satisfaction [3]. Informed by cognitive psychology, Norman emphasized the need for effective interface design to accommodate human perception, specifically the propensity to make errors and inaccurate attributions and the need for memory reminders [4]. Norman, however, did not extend his guideline to the full qualitative experience of outcomes. Therefore, although user design guidelines have their roots in human psychology, the focus has remained on perception and cognitive skills and not on more subjective user experiences, such as meaning-making, identity, immersion, efficacy and enjoyment [3].

According to Overbeeke, et al. [5], all the discussion surrounding the need for design to be 'user-centered,' has not had much result. They still see a predominately cognitive approach that neglects the user somatically and emotionally. Hassenzahl [6] concurs that the few existing UX models that do incorporate hedonic experience are rare and simplistic. The inclusion of qualitative evaluation is complicated by the necessity of researchers and evaluators to not just specify, but agree upon, definitions. Law, et al. [7] note that a universal understanding of user experience is further complicated since extending beyond the traditional usability framework of user cognition and performance means operationalizing individual subjective experience across cultures.

Nevertheless, HCI practitioners continue to explore several approaches, aspects, and perspectives in an effort to define the principles behind non-utilitarian concepts in order to develop more effective technologies. Turkle [8] and Reeves and Nass [9] explored the social meaning of technology on attributions for self and projected understandings. Ehn and Löwgren [10] used the term 'quality in use' to describe the balance of aesthetic, ethical, and functional qualities. Hassenzahl [6] proposed an integration of the subjective nature of experience as it impacts the perception of a product with the emotional response to a product and the variations in context. Broader interpretations such as these try to address the balance between reductivist cognitive approaches and holistic, socially-constructed phenomenological perspectives. Meta-analyses of evaluation approaches have tried to identify the relationship between objective, task-oriented performance measures and non-utilitarian hedonic aspects, such as aesthetics, enjoyment, stimulation and self-expression [see, for example: 3, 11, 12].

Evaluative frameworks for emerging technologies, however, continue to have a domain-specific emphasis, rather than one focused on user-centric goals and experience that moves individuals across devices and platforms [13]. Augmented reality evaluations, for example, tend to concentrate on perception, performance, and collaboration [12] within the context of application functionality rather than on beliefs and motivations. Gaming and other entertainment-focused technologies highlight the concept of enjoyment over usability, although the two are mutually dependent [14]. Sweetser and Wyeth [15] argue that there is no common heuristic for evaluating user enjoyment of games. They suggest that many of the theories, such as attitude attributions, social context, narrative transportation and cognitive appraisal, are too discrete and lack the universality necessary for broad application. Therefore, they propose Csikszentmihalyi's theory of flow as a unifying principle. Roth, et al. [16] have examined the role of narrative-rich games and recommended an assessment approach informed by entertainment research. McCall, et al. [17] propose the use of presence, defined as the feeling of being in a particular place or with another real or virtual person, in the context of the Milgram and Kishino [18] 'virtuality' continuum ranging from real to virtual environments.



Source: Milgram & Kishino, 1994

3 The theoretical underpinnings of the Positive Engagement Evaluation Model (PEEM)

We agree with those who suggest that an evaluative system for any type of immersive or interactive mediated experience must be based on human psychology. However, we argue that most models overlook the interrelationship of unconscious processing and integration of sensory stimuli in the human brain with conscious understanding of experience [19]. Research from neuropsychology has shown that the individual's sense of human experience—the conscious awareness of self and existence in an environment—is created within the continually evolving exchange between conscious and unconscious processes that integrate multisensory information in the context of previous experience and beliefs.

Based on psychological theory and findings in neuroscience, we theorize that:

- Attention is the precursor to user experience and is the product of unconscious processing at the instinctual level
- Engagement is a by-product of attention when the brain consciously processes affective experience and assigns meaning
- The ability of a user to interact, navigate, and experience immersion and enjoyment that underlie theories of optimal engagement, such as flow, rely on a designer's ability to understand principles of sensory perception
  - 95% of human processing happens at the unconscious level
  - Unconscious processing is driven by primary human goals focused around social connection as central to the survival instinct [20].
- Humans exhibit a biological preference for real over virtual, however both virtual and physical stimuli impact the psychological sense of presence and activate unconscious arousal responses. This response directs attention and results in the individual's ability to consciously interpret an activity or action as relevant, desirable, valuable and pleasurable
- Narrative is fundamental to human communication. The brain processes all information using narrative structure as the sorting device to link multisensory perceptions and meaning for later recall
- Narrative is the universal factor in the ability of the 'suspension of disbelief' that underlies immersion. Where Roth, et al. [16] suggest that the introduction of narratives requires a new evaluation of user experience, we argue that, based on the way human brains process and store information, narrative experience does not require an overt storyline. Narrative experience, or what Green [21] calls 'narrative transportation,' can occur whenever a mediated experience allows an individual to immerse in such as way where even a simple task-completion to become part of the user's identity and personal story
- Theories of narrative transportation [22], flow [23] and presence [24, 25] all involve the fading away of conscious reality and sense of time, while attention is focused on the targeted task or mediated experience
- Flow and transportation theories differ in the relative engagement of conscious to unconscious processing related to the task (higher directed focus) or narrative (higher sense of presence) [26]. Both result in positive qualitative experience with enhanced sense of self
- Sustained focus described by flow and transportation theories require the coordination of conscious and subconscious processing and the maintenance of a continual balance between unconscious arousal and conscious control.
- Enjoyment is a by-product of the positive reward system triggered by meaningful immersion
- Research based on cognitive learning theories demonstrates the importance of responsive feedback to improve and reinforce learning, skill-building and mastery, enhancing self-efficacy and social validation
- Self-efficacy is a primary influencer of positive experience and the future motivation to engage with and share applications and devices

4 The influence of flow and transportation in UX evaluation

Until recently, the distinction between games and productivity was as clear as the delineation between different media technologies and devices. As those boundaries blur, there remain some fundamental differences among application goals that influence design and development decisions. Pagulayan, et al. [27] made several distinctions between productivity applications and games, as summarized in Table 1.

Table 1. Games versus Productivity Applications

Games	Productivity Applications
Process focus	Task/goal focus
Internally-defined goals	User-defined goals
Artificial world context	Reality context
Impose restraints	Remove constraints
Variety	Consistency
Emotion focus	Function focus

Consumer software, however, is becoming 'gamified,' just as devices have become multi-functional and media flows across devices. Applications, such as *Foursquare* or Microsoft's *Elevation of Privilege*[1], are part of a growing trend to integrate game design elements to non-game context to motivate users and increase user efficiency, behavior change, civic participation, and learning [30, 31]. Concurrently, the serious games movement is stretching the traditional limits of games through pervasive gaming, expanding the 'magic circle' of play into new contexts, situations and environments, socially, temporally, and spatially [32].

[1] *Elevation of Privilege* is a game developed at Microsoft to make the process of assessing security vulnerabilities in software system diagrams less tedious and more engaging by integrating game mechanics based on the card game *Spades* [28] J. E. Corter and D. C. Zahner, "Use of external visual representations in probability problem solving," *Statistics Education Research Journal,* vol. 6, pp. 22-50, 2007, [29] C. Padesky, "Schema Change Processes in Cognitive Therapy," *Clinical Psychology and Psychotherapy,* vol. 1, pp. 267-278, 1994..

We believe that the limitations of domain- or application-specific user evaluation tools pose serious problems for designers and developers in a world with converging technologies and mobile interactive content models. While both task-based and narrative-based applications can generate the flow state in users, tasks and narrative activate different areas of the brain. We, therefore, propose an evaluation model that distinguishes between task-based and narrative-based interactive and mobile technologies that is applicable to entertainment, gaming, education, or productivity implementations.

4.1 Flow Theory in game design

Csikszentmihalyi's Flow Theory has been frequently used to evaluate engagement and media enjoyment in gaming, interface design, and technology use [for example, see: 15, 33, 34-37]. Flow is the psychological state of optimal engagement where the user becomes so engaged with the application, that he or she loses track of time and peripheral activities and consciously directs his or her attention to a goal or task with clear objectives. The tennis legend Pete Sampras, for example, described his experience of playing 'in the zone,' where he felt that nothing could go wrong and the tennis ball seemed as "big as a grapefruit" [38]. For a discussion of flow theory applied to augmented reality applications, see Neal [26].

Many games, gamified practical applications, interactive marketing properties and educational technologies, however, create a narrative structure that obscures the task focus and goal clarity and activates the user's emotions, enhancing empathy and the psychological sense of presence, or the subjective sense of 'being there' within a virtual, imagined, or hybrid environment [39]. In this condition, the user also loses track of time, as described in the flow state, but rather than conscious-directed attention to the task, experiences the sense of being transported by the narrative [40, 41].

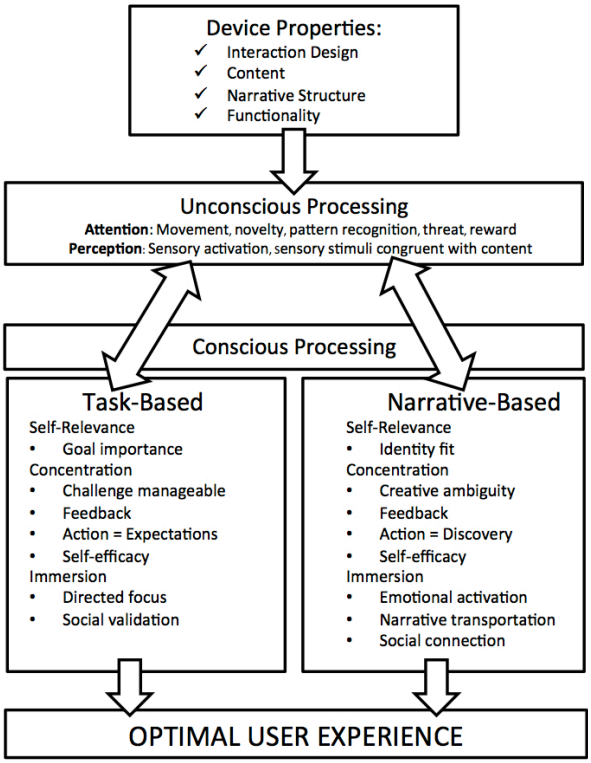
5 Capturing drivers of optimal engagement

Task and narrative-based applications activate different brain regions when users experience state of optimal engagement, or flow. In task-based applications, the state of flow depends on acute attention to the task at hand. In narrative-based applications, the experience of flow is contingent upon the engagement of user empathy and imagination to produce the sense of 'narrative transportation,' or stepping into a story and feeling present, or psychologically immersed, in the imagined or virtual reality. The task versus narrative distinction in the evaluation process keeps the product developer focused on the primary drivers of optimal user experience and behavior and avoids the semantic traps of artificial categorization such as 'useful,' 'fun,' 'entertainment' or 'work.'

We propose that developers and designers can increase the probability of creating optimal user experience and engagement by using the PEEM decision tree and appropriate task- or narrative-based matrix to guide their design and evaluation process. Within the context of the task-based or narrative-based matrix, the PEEM isolates the dominant conscious and unconscious psychological variables and triggers appropriate to each, as depicted in Figure 1. Evaluation can then be made from the perspective of the designer/developer as intention or from the perspective of the user as experience.

By linking the conscious and unconscious processes behind cognition, motivation and perception with optimal engagement theories of flow and narrative transportation, the PEEM provides a holistic assessment model that reflects the behavioral and emotional implications of the underlying neurological structure of the human brain.

Figure 1. Rutledge and Neal's Positive Engagement Evaluation Model (PEEM)



6 The PEEM matrix for positive engagement evaluation

The PEEM begins with a decision tree that guides designers and product developers to an evaluation matrix based on the task- versus narrative-based goals and structure of the product. The evaluation matrix distills the theoretical framework into a series of evaluation prompts from either the developer or the user's point of view through eight domains:

goals, attention, concentration, interaction, content, identity, collaboration and emotional outcome. The PEEM Task-Based Matrix is currently in pilot studies with the Narrative-Based Matrix to follow. For example, we are testing a preliminary version of the task-based PEEM matrix on augmented reality applications [42].

6.1 Goals

Goals and expectations are the motivators of human behavior and are inherent in any interaction, human to human or human to device [43, 44]. Flow experiences are goal-directed, requiring mental energy and appropriate skills. Clear goals establish the boundary of accomplishment and the field of endeavor by providing a static point by which to measure. The process of progressing towards a goal is the dominant source of the reward experience in optimal engagement. Goals are obvious components of applications that are task-oriented, from games to productivity, however goals are equally important in narrative-based experiences [45, 46]. Throughout western culture, narrative structure has a built-in pattern, or story arc, that creates a powerful expectation of resolution and disclosure. The pursuit of resolution motivates exploration of the story. Lack of resolution of a story arc creates cognitive dissonance, dissatisfaction and displeasure [47, 48].

6.2 Attention

The critical component for engagement is the ability to attract and keep attention, no matter what the technology. All physical and psychological experience, including our ability to notice and attend, is first filtered and then constructed by subconscious sensory processing systems [49], therefore user experience, as the outcome of attention, starts in the brain [19, 50].

The brain processes new information based on the survival imperative, and gathers multi-sensory input to evaluate relevance, novelty (movement, newness, unusual behaviors), and pattern comparison (familiarity, sense-making) to determine the potential for threat or reward. Conscious attention is the result of unconscious arousal that occurs in response to the 'pain or gain' threshold [20].

6.3 Concentration

Once information is attended, cognitive processing continues by comparing new information to previous experience to determine the level of reward or threat. Content that is perceived as a reward will also engage conscious processing to evaluate the positive potential. Research demonstrates that information that is both relevant to the user's goal and self-referent (consistent with or enhancing the user's sense of self) heightens the perception of value and motivates further attention [51]. Continued attention creates concentration. The ability to self-reference and self-identify promotes the favorable evaluation of a product or experience no matter what the quality of content logic or information. This is the neuromarketing rationale behind product placement [52-54].

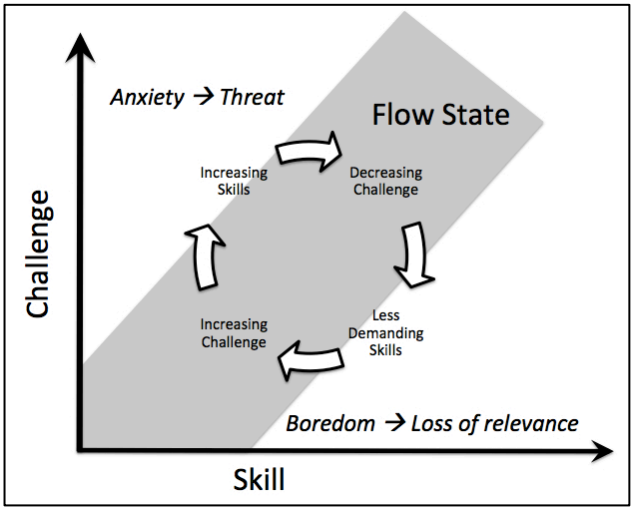
The greater the amount of cognitive and emotional investment in meeting a challenge or task, the more absorbing it becomes. In flow theory, optimal engagement occurs when all available energy and skills are devoted to an activity [23]. This demands balance between challenge and skills to maintain concentration without the task triggering a threat response that creates cognitive withdrawal to protect the user's identity and self-esteem. Thus the activity must be responsive to player cognitive, as well as emotional and perceptual limits. As illustrated in **Error! Reference source not found.**, optimal experience is not a steady state but an evolving process of skill matching challenge through increasing and decreasing difficulty levels and opportunities for skill-building and mastery.

6.4 Interaction

Interactive and mobile applications are designed for on-demand performance, allowing the product developer to create opportunities for user control (safety) and personal investment (identity) [55]. To maximize positive engagement, product developers can intentionally target the five aspects identified within the PEEM matrix.

Goals and action steps toward goal achievement need to be visible early and the path reinforced at fitting times to prevent concentration gaps (loss of relevance) or frustration leading to anxiety, triggering a threat. Both of these situations represent flow exit points [26] and disrupt and often discontinue application or product use and negatively impact the emotional valence of the experience.

Figure 2. The responsive relationship between challenge and skill for optimal engagement



6.5 Content

Content choices blend traditional UX, such as ease of navigation, with product development design decisions that promote positive emotional and identity-based engagement. These frameworks are not an 'either/or' proposition. The balance of function versus experience is the essential conundrum in UX. The purpose of the development of the PEEM is to provide a way to approach integration of practical functionality with an understanding of the resultant triggering of the emotional center and subsequent translations of emotions into conscious attributions of value. Functionality that supports positive emotions includes:

6.5.1 On-demand, self-relevant content

By definition, interactive content is self-relevant because it is pulled to the user on-demand, not pushed as in mass media distribution or marketing. Useful and accurate content provides a solution to a problem or question, creating a sense of safety and enhanced self-efficacy. Additional preferences give the user control over how the information is displayed. The user has choice over exactly where, with whom, and on what device to activate and experience the information. The sensation of success and control by the brain is processed as reward and triggers positive emotions (pride, happiness) through the dopamine system [56] and is translated by the conscious brain as successful, personal validation and efficacy (identity) [57, 58].

6.5.1.1 Filter and control of content

The ability of a user to filter content assures that information and experience are self-relevant and timely. The content needs to be consistent with activity logic and purpose, contributing to user understanding of the process while simultaneously enhancing experience and avoiding the potential for activity or attention disruption.

6.5.2 Rich media content with emotional triggers

The integration of fluid and seamless rich media, allows designers to trigger and engage specific emotions that enhance enjoyment, such as wonder, sense of adventure, pleasure, anticipation, and curiosity. Product designers can also anticipate and build in support to moderate negative experience, such as frustration, confusion, or anger, by creating accessible and 'human' help messaging, obvious means of escaping a problem, such as 'escape' icons, and error-proofing interface design to avoid user-generated disruptions.

6.5.3 Technology with social behaviors

The integration of social behaviors in HCI increases the propensity of individuals to anthropomorphize technology, attributing human qualities and sensibilities and interacting with technologies based on habitual social norms [59]. Interfaces that incorporate avatars with human-like images and qualities and friendly, interaction styles, such as 'Good job!' 'How can I help you?" or 'What would you like to do next,' increase user trust. Interaction opportunities that provide a sense of control and participation create ownership through the psychological sense of reciprocity. When individuals receive something of value, they feel a sense of connection and social obligation that motivates further engagement and enhances feelings of belonging and identity enhancement [60, 61]. The increase in personal mobile devices has accelerated the psychological adoption of device as extension of self and amplified the identity effect [9].

6.6 Identity

Effective interactive design allows opportunities for skill-building and mastery and responsive feedback of progression. Skill building allows users to maintain a sense of flow in tackling increasingly difficult challenges [45]. Knowledge of success in the face of challenge reinforces positive beliefs about self-competence and self-efficacy, expands attention and thought-action repertoires and promotes self-esteem, resilience, and intrinsic motivation [62, 63].

Identity and self-image are also enhanced through adoption and visualization of new ways of being and thinking. A hallmark of cognitive behavioral therapies and creativity work, the act of imagining, projecting and transportation creates new images of self that create somatic changes and increase neural processing connections [28, 29]. Both task-based and narrative-based interactive technologies contribute to increased self-efficacy and self-esteem through the adoption of new competencies and enhance social identity flexibility through imagination and transportation.

6.7 Social connection and collaboration

Social needs are some of the most powerful forces of persuasion. Humans are neurologically-wired to seek social attachment [64]; they are highly motivated by social perceptions, influence, inclusion, acceptance and comparison [65]. The popularity of social networks and social gaming illustrates the drive toward connection, social validation and social comparison that drives human behavior. Design decisions that integrate opportunities for users to voluntarily engage with others, increase motivation for future use, user satisfaction and user recommendations through the persuasive power of social connection, competition, and collaboration.

6.8 Emotional outcome: Attitudes, enjoyment, satisfaction

The net user experience of a device or application is the distillation of the experience into an attitude or emotion, such as enjoyment or satisfaction. This becomes the representative shorthand, heuristic, or mental model of the user's understanding that is passed on to friends and retold to oneself in memory recall. The integration of reward systems that encourage intrinsic motivation and highlight personal accomplishment enhances positive attitudes and emotions.

Gameplay structures and the gamification of various activities are a way of describing effective cognitive learning strategies: the integration of visible goals, clear progress markers, responsive feedback, earned rewards, and social validation. Product developers can enhance net user experience by conscious building in reward systems, such as scores, rewards, badges and leaderboards. Social connectivity, social validation and social comparison also function as motivators and trigger reward systems in the brain. Social connectivity and social identity can be increased through incorporating sharing features, such as ratings, comments, leaderboards, or 'send to friends.'

7 Limitations and implications

The Task-Based Matrix of the PEEM is currently being validated in several studies (see Table 2). Results from these studies will be used to adjust the Task-Based Matrix and inform the Narrative-Based Matrix prior to its evaluation and the completion of validity and internal consistency measures. The purpose of the PEEM is to 1) further the work done in creating a theoretically integration approach to user experience and 2) provide a customizable tool that facilitates the design and development process for product development and increases the probability of optimal user engagement.

8 Conclusion

Mobile users, interactive technologies and applications, and fluid media boundaries are redefining user experience, design, development, and testing. The trend toward collaborative, transmedia narrative-based properties challenges domain or technology-specific evaluation frameworks and makes singularly focused usability and functionality testing insufficient to design for optimal user experience. This paper introduces the Positive Engagement Evaluation Model (PEEM), to incorporate qualitative experience in interactive and mobile applications. The PEEM integrates current findings in neuroscience, cognition, and perception with theories of optimal engagement, flow, narrative transportation, persuasion, and motivation. Currently in pilot testing, this model incorporates decision-tree and evaluation matrixes that distinguish between the critical differences of task-based and narrative-based applications. The task-based matrix presented here is the first of the two evaluation matrices in development based on the PEEM. The matrix presents evaluation criteria framed from both the designer/developer and user perspectives to maximize its usefulness in the design process. Our goal is to provide developers, designers, and producers with a customizable tool based on current findings across the social sciences and neurosciences, to guide decisions and iterative processes of testing and development.

Table 2. Positive Engagement Evaluation Model: Task-Based Matrix

	ELEMENT	CRITERIA		DESIGNER INTENTION	USER EXPERIENCE
1	**Goals**	Clear alignment to task and user goals. Application designed to address user problem or task; provides evidence of clear solution path	1	Activity and goals are clear	I felt the activities, goals and purpose were clear
			2	Tasks and activities align to goals	The tasks and activities made sense to the goals and purpose
			3	Visible path or steps to goals with manageable solutions	I understood how to reach the goals and felt capable of doing it
2	**Attention**	Ability to stay focused on tasks application; ease of interaction; immediate feedback to validate effort required for interaction	1	Tasks sequence seamlessly	I was able to move through the steps and tasks seamlessly
			2	UI controls easy to understand and follow	Application controls were easy to use and did not distract me from the application
			3	Visual or auditory support enhance and directs understanding	The visuals and sounds contributed to my ability to understand what to do
3	**Concentration**	Ability to attend to relevant information; cognitive clarity and congruence; perceptual organization Feedback to guide actions through process and redirect attention to task	1	UI keeps attention on tasks and display through adequate and appropriate challenge levels	The application kept me interested and challenged
			2	Tasks are easy to understand and is purpose clear	I could tell what to do and the purpose of the actions
			3	Feedback provides learning structure through task completion	I received the feedback I needed to advance or achieve my goals.
4	**Interaction**	Clear action steps, content choices, lack of interruptions; integration of social patterns into HCI; responsive to user	1	Player has multiple avenues to experience sense of control, such as personalization, activity choices, or filtering	I felt in control over my actions and strategies
			2	No interruptions such as configuration, error messages, or irrelevant data.	I was not bothered by interruptions such as error messages or irrelevant data.
			3	Interaction, help and messaging from application use social behaviors (first person communication)	The messaging, help and other information within the application felt human and personal
			4	Content and tasks adjust to user needs and skills	The content and tasks adjusted to my needs and skills
5	**Content**	Ease of navigation and filtering to keep information and experience self-relevant and timely; integration of emotional triggers to enhance enjoyment and commitment; interaction opportunities to create ownership	1	Sound, touch, and rich media (imagery, overlays, video, display enhancements) are seamless	The images, overlays, video, and information displays are seamless
			2	Content designed to target specific emotions (wonder, adventure, pleasure, intrigue)	The content engaged positive emotions (e.g., wonder, adventure, pleasure, anticipation, curiosity)
				Content designed to provide support for negative experience (help messaging, 'escape' icons)	The content engaged negative emotions (e.g., frustration, confusion, anger)
			3	Content designed to fit affordances to eliminate task disruption (i.e. retrieval time)	The content flowed well and did not interfere with achieving my tasks or goals
			4	Content is relevant to task and supports activity logic and purpose	The content such as images, video or audio made sense with the activity and purpose
6	**Identity**	Self-relevant, obvious solution to need; actions reinforce self-efficacy, accomplishment and self-esteem	1	Activities provide integration or imaginative projection of user into experience.	I felt absorbed in the application or it engaged my imagination in the experience
			2	Structured skill-building and mastery	I increased my skills or knowledge
			3	Responsive feedback of progression and accomplishment	I received evidence of my progress and accomplishment

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ELEMENT	CRITERIA		DESIGNER INTENTION	USER EXPERIENCE
7**Collaboration**	Reinforces social connection and encourages social validation	1	Integrated social connection or comparison (leaderboards, social network links)	I could compare my experience to others or engage socially in real time, shared use or social networks links
		2	Validation, reinforcing feedback from social element.	I received feedback on my experience relative to other users
		3	Ability to create, participate or personalize content	I was able to create or personalize content
8**Attitudes, Enjoyment, Satisfaction**	Positive experience for motivation to use again; motivation to tell others, ease of sharing	1	Inherent motivation or reinforcement to redo or repeat activity (emotional, reward-based, or social)	The rewards or feedback made me want to redo or repeat the activity in the future
		2	Opportunities for comparison or competition (scores, rewards, badges)	There were multiple points where I could collaboration or share my experience through scores, rewards, or badges-mrn-or display and shared tasks
		3	Integrated sharing feature with ratings, comments, leaderboards, or 'send to friends'	There were sharing features where I could see and contribute ratings, comments, or votes

INSTRUCTIONS:
Evaluate each numbered item as follows:

Not at all	1
Partially	2
Mid-range	3
Mostly	4
Consistently	5

Add all three scores for each item and post as the net task score. Scores will range from 0-15 for each net task score. This gives an average score for each task.
Net experience = addition of all net Task Scores /10

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