HOW MODS EMPOWER CO-CREATION AND REMIX

By

Rebekah Small

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ABSTRACT

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The field of user experience design (UX) has much to offer the process of video game development but is only lightly present in current games research. This paper argues that the current understanding of games through a critical theoretical lens or human computer interaction (HCI) approach does not address many important game interactions and experiences. Collaborative experiences and participatory design such as fan-made video game modifications go unexplored; therefore, developers miss out on key insights regarding the wants and needs of their users. By examining user data, usage statistics, and interface analysis about modifications for the game *Skyrim*, this paper details the type of fan-driven innovation and design that could be beneficial to both researchers and developers.

This thesis is dedicated to the amazing women who
made it possible, Jessica Gibbons and Liza Potts.
And my dad, the best designer I knew.

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INTRODUCTION

In this paper, I analyze video game modifications ('mods') as part of an ongoing call in game design to integrate user experience design (UX) principles into the game development process. I believe that modding, as an existing participatory process, is well positioned to provide insight on the potential of game producers and game players working together to craft better experiences. This includes the recent increase in the use of participatory design in games intended for educational or health outcomes. Throughout this study, I frame modding as a collaborative design process that exists within a network of fan created content. The literature I reference spans disciplines and includes research on UX, usability, technical communication, and games studies. This interdisciplinary approach is often missing from other game research and is meant to break through the institutional silos present throughout academic and industry research.

While the phenomenon of modding has been studied for its economic value (Postigo 2007), technological advancement (Scacchi 2011), and as a cultural phenomenon (Sihvonen 2011), it has rarely been studied as a design practice, let alone a communication or experience architecture. Let us first establish a definition. For the purposes of this paper, the term 'mod' refers to "[w]ays of extending and altering officially released computer games, their graphics, sounds and characters, with custom-produced content" (Sihvonen 2011). This paper specifically focuses on the network that exists between mods themselves. While studying the top 50 mods for the video game *Elder Scrolls V: Skyrim*, I discovered a network of mods which rely on each other to

function. To show how mods are a communication and experience design practice, I detail how the mods that boast the largest number of dependent mods all include some change to the user interface (UI) of the game. This particular change in design and functionality goes beyond simple content additions and expansions into alterations that provide a fundamentally different user experience. Additionally, these mods make in-game fan content much easier to create, allowing those with less technical knowledge to participate in the modding community.

DEFINING TERMS

General Definitions

Within gaming, both the industry and academic research on the topic, there are definitions that require attention and clarity. Below, I list several terms that are especially applicable to this paper.

- **User Experience (UX)**: The practice of user experience design is the creation of a product, service, or policy, often across physical and digital spaces, with an emphasis on the participant's perspective and journey.
- **User Interface (UI)**: The term user interface refers to the visual elements of an online experience which signify the affordances and control available to the user.
- **Mod**: A mod (short for modification) is a kind of plugin that alters a game's functionality in some way, usually affecting the visual design and/or mechanics of the game.
- **Dependent Mod**: This is a kind of mod that inherits the functionality of a larger mod. These mods typically allow for smaller, more specific changes to a game.
- **Modder:** A modder is an advanced user who makes visual changes, adds content, or adjusts the functionality of a game. They work individually and in teams using an iterative design process similar to professional software development teams.
- **Modding Community**: A network of modders and players who use mods, design mods, and produce media content based on their use of mods.

- **Co-Creation:** In this context, co-creation refers to the collaborations between official game developers and mods, between mods and other modders, and between mod users and mod developers. All of these levels of involvement affect each other and influence the broader modding community and gaming in general.
- **Participatory Design**: Similar to co-creation, participatory design is a process in which development teams work with stakeholders throughout the design process. Such a process is the opposite of the more traditional software development methods where stakeholders are consulted only during the final testing phase of a fully built product or service.
- **Community Participatory Design:** Community Participatory Design (CPD) is an approach to participatory design that puts added emphasis on the communities affected by the design in question. This approach is especially important for at-risk groups whose information could be exploited for the purpose of capital gain by designers.
- **Race:** While normally referring to a set of physical traits shared by a group of humans, Race in this context refers to the abilities and statistics asigned to certain classes of characters (such as Elves being intelligent and sneaky, Orcs being bullheaded and brutish, etc.) which are limited to a specific aesthetic range within a game. This association of physical appearance with abilities and traits has been passed down from table-top gaming and unfortunately reinforces systemic racist views about predetermined ability.

- **Player Character:** Player character (PC) is the character that the user controls when they are playing a game. In a multiplayer game, there can be a selection of characters that are assigned as either a PC or NPC based on the players' choices.
- **NPC:** NPC stands for Non-Player Character, which is a character in a game that the user does not control.
- **Heuristic:** A heuristic refers to a set of guidelines that are used to assess the effectiveness of a design.

Mod Descriptions

- **SKYUI:** SkyUI is a mod that alters the user interface of the game *Skyrim*.
- **ApachiiSkyHair:** This is a dependent mod which imports hair models from the Sims 3 and 4 games into *Skyrim* in order to expand character creation options. It relies on the functionality of a mod that affects the character creation interface.
- **ShowRaceMenu**: This Skyrim mod reconceptualizes the character creation interface of Skyrim and allows other modders to import 3D modeled items. This mod allows the ApachiiSkyHair mod to work, which in turn allows for hundreds of other dependent mods to utilize other hair mods.
- **RaceMenu:** This *Skyrim* mod is another redesign of the character creation interface. It allows the user more control and freedom over all aspects of their player character (facial features, hair color, proportions, etc.) and boasts several hundred dependent mods which rely on the expanded affordances of character editing.

LITERATURE

While there are some user experience professionals involved in the video game development process (Player Research 2017; Game Studies - The Semiotics of the G…), the knowledge of user experience, and the use of the associated vocabulary, remains absent from recent video game research. Research on game development and culture found in publications such as Game Studies, ACM (SIGCHI), Well Played (ETC), Games and Culture, etc. seems to swing wildly from a theoretical foundation based in liberal arts to research that is founded in social science and human computer interaction.

The critical theory approach to video game research seems stalled on the question 'are video game narratives something that should be studied/are video games art?' despite a wealth of knowledge being developed on that topic in other fields (Tavinor 2009; Rough 2018; Cho et al. 2018; Oliver et al. 2016; Bourgonjon et al. 2017; Bates and LaMothe 2001; Smuts 2005; Wolf 2012; Gee 2006). The lack of traction that games studies has in departments which normally teach literature, film, and other traditional media has kept this research from growing in scale and depth, resulting in a cycle of surface level theory with little effect on the pedagogy of the field.

Meanwhile the Human-Computer Interaction (HCI) approach offers some hope in their inclusion of usability heuristics, but this approach is not suited to address issues of community or the intricacies of players' attitudes. The trajectory of HCI games research seems to have turned from theoretical and quantifiable concerns at the dawn of video game research (Cassell and Others 2002; Barr et al. 2007) to specific research to aide serious games development (Velasco et al. 2016; Gerling et al. 2015; Ferri et al. 2017).

These studies suffer somewhat from a lack of generalizability and practical application. Their goal of supporting more meaningful, positive, impactful gameplay is a worthwhile one, but the games they develop rarely make it out of the labs where they are developed and tested.

While these approaches are both useful for their fields, it seems that the biggest priority in an industry that has struggled so much with community tension and aggression should be curtailing the misogynistic, racist communities that have latched onto video games as their territory. Unfortunately, neither of these approaches reach the video game developers in large studios who are designing AAA games (popular, big budget titles) and who have the largest influence on the industry as a whole. Research suggests that those developers are mainly working from systems of informal practitioner knowledge instilled in the production studios where they work (O'Donnell 2014). Ultimately, the critical analysis approach lingers on old questions while the social sciences and HCI fields focus too narrowly on specific tech to create helpful takeaways for practitioners.

Meanwhile, experience design and interaction design have successfully scaffolded industry work with academic research in order to support and embolden students and professionals alike; therefore, they are better suited to assist in this research and development in the future. Books like *Rhetoric and Experience Architecture*, series like *A Book Apart*, and others have successfully combined academic research with industry insights. In fact, UX has already been introduced into the video game design industry in some small way, (Zhu and Fang 2014; Sánchez et al. 2012) but

it is extremely difficult to find out on what scale. Even on the periphery of user experience topics like digital and cultural rhetorics have made it onto the topic of games through authors like Tracy Fullerton and other feminist scholars (Fullerton et al. 2008).

Don Norman, author of *The Design of Everyday Things*, coined the term User Experience Design (UX) to cover, "the entire process of acquiring and integrating the product, including aspects of branding, design, usability, and function." (What is User Experience (UX) Design?) Within the umbrella of user experience design exists subsets of the approach including information architecture, writing for the web, interaction design, usability, etc. With this in mind, it is easy to see how the field of UX is well suited to provide heuristics for the many interactions within video games, participatory culture, and much more; however, it has failed to make an impact on those fields. In an effort to fix this, one author has made an argument for the use of empirical UX heuristics in these areas of video game development (McArthur 2017; McArthur et al. 2015). While this approach was clear in stating that UX has much to offer to video game development, it failed to explore the ways in which the intricacies of video games could improve UX methods and approaches. The small amount of information out there on the existing relationship between UX and game development seems to approach UX as a heuristic alone and not as a set of methods that could be used to conduct in depth research into design practices (Player Research 2017).

The character creation interfaces often encountered at the very beginning of a game, where the player decides the appearance and sometimes the performance traits of their character, are an apt example of an interaction in games that would benefit

from in-depth UX research. Victoria McArthur's work on an avatar affordances framework shows how we might apply usability heuristics to review the affordances of character creation interfaces (McArthur et al. 2015). Building off of this, McArthur calls for other scholars to apply practical, low investment UX and usability methods, such as eye tracking, heat mapping, etc. to video games. Thus far, the vast majority of research on avatar creation and appearance has come from the liberal arts and social sciences approach to video game research wherein the effects of certain affordances have been studied (Bessière et al. 2007; Waggoner 2009; Bailey et al. 2009). However, the disconnect between academia and industry here means that we do not know if and how these results are being built upon as new interactions are developed. While this is a worthwhile endeavor, I believe that a more thorough understanding of video game community design practices can steer UX involvement in a more productive direction. One aspect of UX which has already been brought into the game development process on a small scale is participatory design. In participatory design, end users are brought onto the design team as co-designers to ensure that their perspectives and needs are included and understood. The origins of participatory design have been well documented throughout the field of technical communication (Spinuzzi 2005; Muller and Kuhn 1993; Schuler and Namioka 1993). The original hopes for the practice were solely focused on democratizing workplaces; however, steady developments over the past few decades have introduced considerations of community, participant exploitation, and more (Kelly 2018). This has lead to an approach called community participatory design (CPD) which emphasizes considerations of how the community involved will be affected

(Kapuire et al. 2015; Leavy 2017). These developments are paramount when considering the make-up of the communities that have been brought into a participatory development process in video games thus far including mental health patients, disabled individuals, and children (Balli 2018; Di Mascio and Dalton 2017; Dekker and Williams 2017; DeSmet et al. 2016). However, the practice has also been applied in communities that are already practicing participatory development of a game (Karabinus and Atherton 2018).

In general participatory design, serious games, and user experience, researchers and developers have been making great strides to understand the complexity within a players' or users' role in video and online game development. However, the use of UX in video games requires more than heuristics alone; it must involve an understanding of the communities of people involved in a given design. This study of modding and the collaborative efforts happening within the associated community strives to decentralize the role of the companies that fund the original media while emphasizing the value of collaborative design practices. This examination of mods will illuminate the possibilities of user and community centered design as enacted by users themselves. Specifically, it focuses on how fan created UI affects community participatory design and how this information may be leveraged to improve co-design and co-creation in the future.

METHOD

The Karabinus and Atherton paper from SIGDOC 20'18 introduced a novel way to research participatory design in a game setting without having to infiltrate an unknown space or rely on the little amount of information provided by large production companies that value secrecy above all else. Their study focused on "asynchronous forum-based social deception games wherein participants fulfill all the functional roles that might be observed in a professional organization," a space in which one author was already a participant (Karabinus and Atherton 2018). The other author maintained a neutral distance so as to balance their involvement while maintaining the trust they had from the group. Through this approach, they were able to fully explore the development process of an iterative game design group that operated independently from a game development or production team. The fields of UX and Technical Communication are both represented in that article as the authors bring together game theory, procedural rhetoric, and participatory design. Karabinus and Atherton are quick to point out one of the biggest roadblocks to research like theirs: "To study decision making practices in game design, researchers must find a way to observe those practices in the moment, unfiltered through the distance created by interviews or [...] after-the-fact reporting" (2).

Inspired by the same wish not to interfere with a community by investigating their design practices in an intrusive way, I opted to collect openly available data and report patterns and pathways that I observed. When I began my data collection, I believed that I would find that mods affected design aspects like UI more often than

other game content. While this turned out to not be true, my study did reveal something about the way that modders work collaboratively. Specifically, within the mods that affect UI and usability there exist vast networks of collaborative participatory design between modders. This information helps in the effort to de-emphasize aspects of modding such as economic gain and free labor from users. An alarming amount of research on mods has focused on methods of validating mods and modders in terms understandable to those that would benefit monetarily from that labor (Postigo 2007). I would argue that the natural growth of co-creation that certain modders have managed to realize is worth researching regardless of whether the original game developers benefit from it or not.

This research design is modeled after the Avatar Affordances Framework introduced by McArthur et al. in 2015. McArthur's model proposes a systematic review of the signifiers and affordances of character creation interfaces in games. This methodology is important because it gives researchers the ability to investigate the equity of those interfaces without the ability to perform a straightforward numerical comparison. After collecting data on the top 50 mods for the video game *Elder Scrolls V: Skyrim*, I narrowed my in-depth analysis to three mods based on the most disparate variable among the data available. This variable is the number of 'dependent' or second tier mods which require the mod in question to function, among the top 50 only a select few had a large number of these dependent mods. This focus allowed me to discern what type of mods best enabled other fan creators and designers to participate in the modding community. The mods studied here are similar in their popularity, effects on

user interface (UI) and avatar customization, and influence over the modding community.

I collected openly available data from the most popular website for mods, Nexusmods.com. Nexus provides a robust statistics/analytics page as well as comprehensive data about each individual mod. For the purpose of general comparison, I included the following variables about each mod:

- Mod Title
- URL
- Date Created
- Name of creator
- Name of uploader
- Number of downloads
- Rank (out of all mods, by number of downloads)
- Number of Endorsements - (or "likes", represented by a thumbs up)
- Number of Dependent mods

All but the last variable, dependent mods, were reported at the top of a mod page as shown in Figure 1. I collected data for each of these variables into a spreadsheet, where I then coded the data.

Initially, I collected information on the mods' creation and function, but as I coded this data, I located a far more compelling variable: the last field, # of dependent mods. This variable is significant because it shows quantifiably how these particular mods are empowering other fans to join in the co-creation of mod design. Each of the

three mods I analyze have been used as a starting point for other mods by other players. Therefore, this variable allows us to conceptualize the network of mods and participatory labor surrounding one mod. If it were not for these mods, thousands of other mods would not exist. As research on mods has shown that the more a game is modded the longer its life span, it should follow that certain companies would like to pursue the attention of modders within their demographics (Scacchi 2010; Postigo 2007).

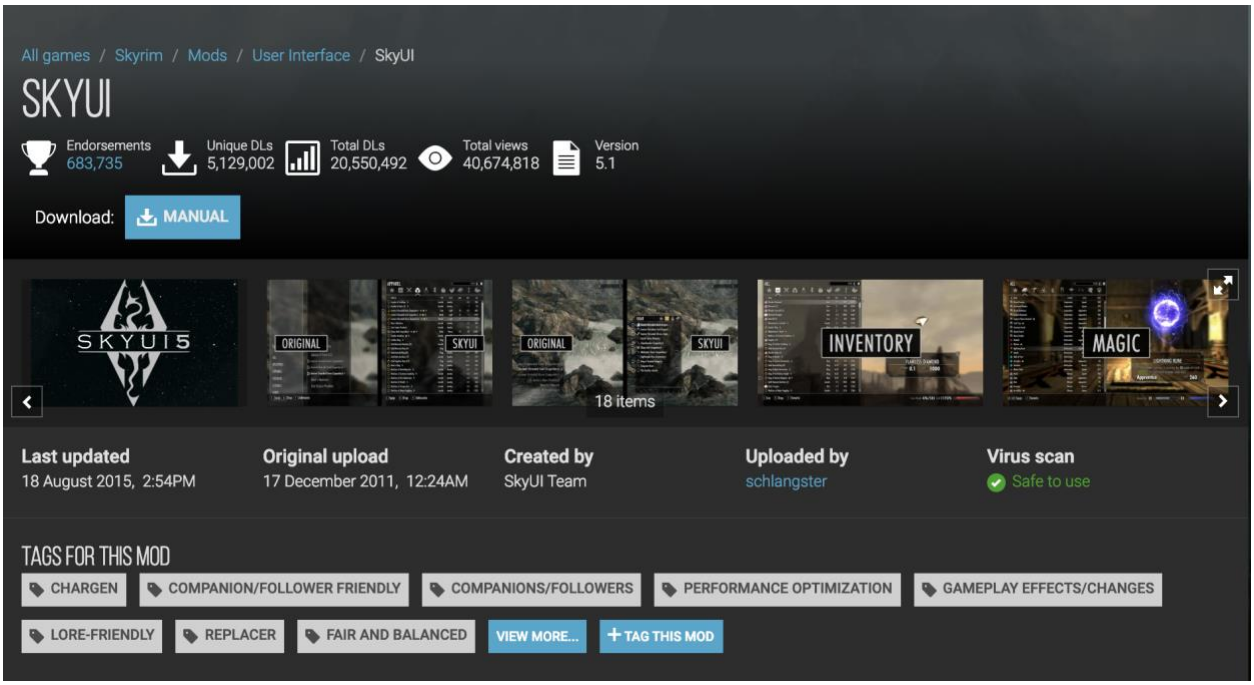

Figure 1. Screen capture of the page on NexusMods.com for SkyUI. The page shows statistics about the mod, screenshots of the mod applied to the game, and tags for the mod.

The user interface (UI) on Nexus mods does not emphasize this network of mods. Dependent mods are not reported at the top of the mod webpage, like the other statistics and variables I collected, but are placed with referential information at the bottom of the listing as shown in Figure 2. Nor does it provide the total amount; this

was calculated after I captured the data. As shown below in Figure 2, dependent mods appear at the same level of importance as requirements for a certain mod, which signals that is information is meant to help with installation but is not necessarily vital to a user's understanding of the mod's value.

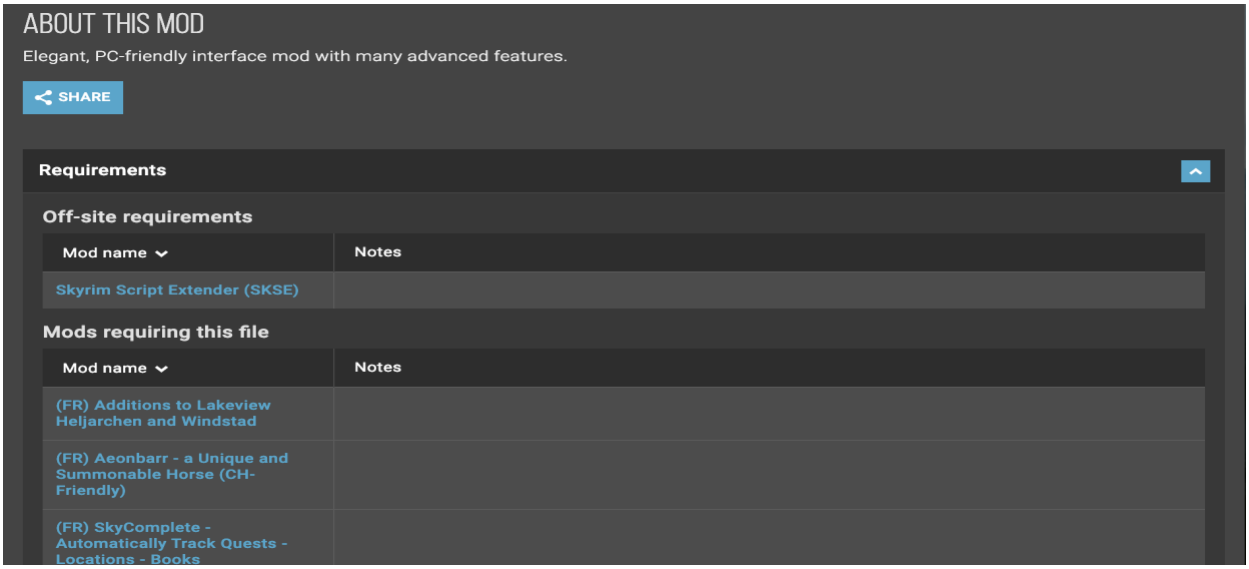

Figure 2. Screenshot of a Nexus Mods page showing the UI of the "Requirements" section. Under "Requirements" the options are "Off-site requirements" and "Mods requiring this file."

RESULTS

It is clear that some of the most popular mods on Nexus Mods for Skyrim are perpetual staples within the community, uploaded to the site only a month after the initial game release in 2011 and used regularly by old and new modders hoping to enjoy the customization that these packages offer. Some have accrued over 18 million downloads in just 8 years (SkyUI). Meanwhile, other long standing mods like software patches are now superfluous, having been replaced by official developers' patches. Included in Table 1 are the results from the top 15 mods within my dataset.

Table 1

Results of the Top 15 Mods Including Data on Name, Rank, Number of Dependent Mods, URL, Date Created, Creator's Name, Number of Downloads, and Number of Endorsements

Rank	# of Dependent Mods	Mod Title	URL	Date Created	Created By	Uploaded By	Downloads	Endorsements
1	2	Skyrim HD - 2K Textures	https://www.nexusmods.com/skyrim/mods/607	11-18-2011	NebuLa from AHBmods	NebuLa1	21,699,270	262,515
2	**646**	SkyUI	https://www.nexusmods.com/skyrim/mods/3863	12-16-11	SkyUI Team	schlangster	18,545,600	638,181

Table 1 (cont'd)

3	85	Fores New Idles in Skyrim - FNIS	https://www.nexusmods.com/skyrim/mods/11811	3-1-2014	fore	fore	16,213,436	257,869
4	**518**	ApachiiSkyHair	https://www.nexusmods.com/skyrim/mods/10168	2-17-2012	Apachii	Apachii	12,647,230	280,573
5	306	Caliente's Beautiful Bodies Edition - CBBE-	https://www.nexusmods.com/skyrim/mods/2666	12-4-2011	Caliente Ousnius and Jeir	Caliente	12,252,685	314,820

Table 1 (cont'd)

6	42	Immersive Armors	https://www.nexusmods.com/skyrim/mods/19733	07-01-2012	Hothtrooper44	Hothtrooper44	10,291,698	323,522
7	59	Climates Of Tamriel - Weather - Lighting - Audio	https://www.nexusmods.com/skyrim/mods/17802	5-28-2012	JJC71	JJC71	9,698,313	221,888
8	2	A Quality World Map and Solstheim Map - With Roads	https://www.nexusmods.com/skyrim/mods/4929	12-30-2011	IcePenguin	IcePenguin	9,472,533	322,183

Table 1 (cont'd)

9	18	aMidianBorn Book of Silence	https://www.nexusmods.com/skyrim/mods/24909	10-2-2012	CaBaL-Emerald Reign-the AMB team	CaBaL120	9,048,832	83,919
10	5	Enhanced Blood Textures	https://www.nexusmods.com/skyrim/mods/607	11-12-2011	dDefinder	dDefinder1	8,630,340	251,599
11	16	Static Mesh Improvement Mod - SMIM	https://www.nexusmods.com/skyrim/mods/8655	2-10-2012	Brumbek	Brumbek	8,110,192	200,458

Table 1 (cont'd)

12	14	Skyrim Flora Overhaul	https://www.nexusmods.com/skyrim/mods/141	11-13-2011	vurt	vurt	8,084,553	157,792
13	**553**	RaceMenu	https://www.nexusmods.com/skyrim/mods/29624	1-07-2013	Expired	expired6978	7,948,173	247,841
14	144	DIMONIZED UNP female body	https://www.nexusmods.com/skyrim/mods/6709	1-21-2012	dimon99	dimon99	7,349,362	166,140

Table 1 (cont'd)

15	45	Better males - Beautiful nudes and faces - New hairstyles	https://www.nexusmods.com/skyrim/mods/2488	12-3-2011	Chris57 and FavoredSoul	Chris57	7,166,981	115,730

The deviation between variables like endorsements (or 'likes'), downloads, and the date created does not vary significantly between the top mods as shown in Table 1. Generally, mods have significantly more downloads than endorsements, most have been around since 2014 or earlier, and most affect a visual element of the game. Because of the consistency in these variables, my interest quickly turned to the variable that differed significantly between mods: number of dependent mods. This number varies wildly from 2 to over 600 and is not correlated with number of downloads or endorsements.

After I singled out the mods with the most dependent mods as the narrow focus of this paper, my next steps were to track the similarities and differences among the highest ranking of that sort. What I found were three mods (SkyUI, ApachiiSkyHair, and RaceMenu) that boasted several hundred dependent mods each. All of these mods affect the user interface of the game. My discussion of these findings delves into the details of each mod and why it has led to the creation of hundreds of subsequent mods. The significance of these mods is in their ability to represent a portion of game fans

who are already actively participating in the game development process. In the conclusion I provide general takeaways for practitioners in both UX and game development who wish to capitalize on, or better understand, the phenomenon of modding.

DISCUSSION

Building off of the model described by McArthur et al. in their avatar affordances framework article (2015), I was able to perform a comparison of the disparate design elements included in each mod, which vary wildly in purpose and function. In the article, the authors maintain that a subjective, critical view of data is helpful when quantitative methods are unable to capture a meaningful comparison between certain functionalities (McArthur et al. 2015). This approach allowed the authors to compare complicated user interfaces that were similar in purpose but incomparable in functionality. In conducting this comparison, I was interested in a few things: what does each mod do, why does it incur depended mods, how have these mods influenced the modding community, and how does each mod function as a mediation point for content co-creation.

SkyUI Mod

"Elegant, PC-friendly interface mod with many advanced features."

- **Nexusmods.com**

SkyUI is a *Skyrim* mod that overhauls the user interface (UI) of the game. This includes the player's inventory (Figure 3), favorites menu, abilities menu, and game settings, which includes the menu for managing mods.

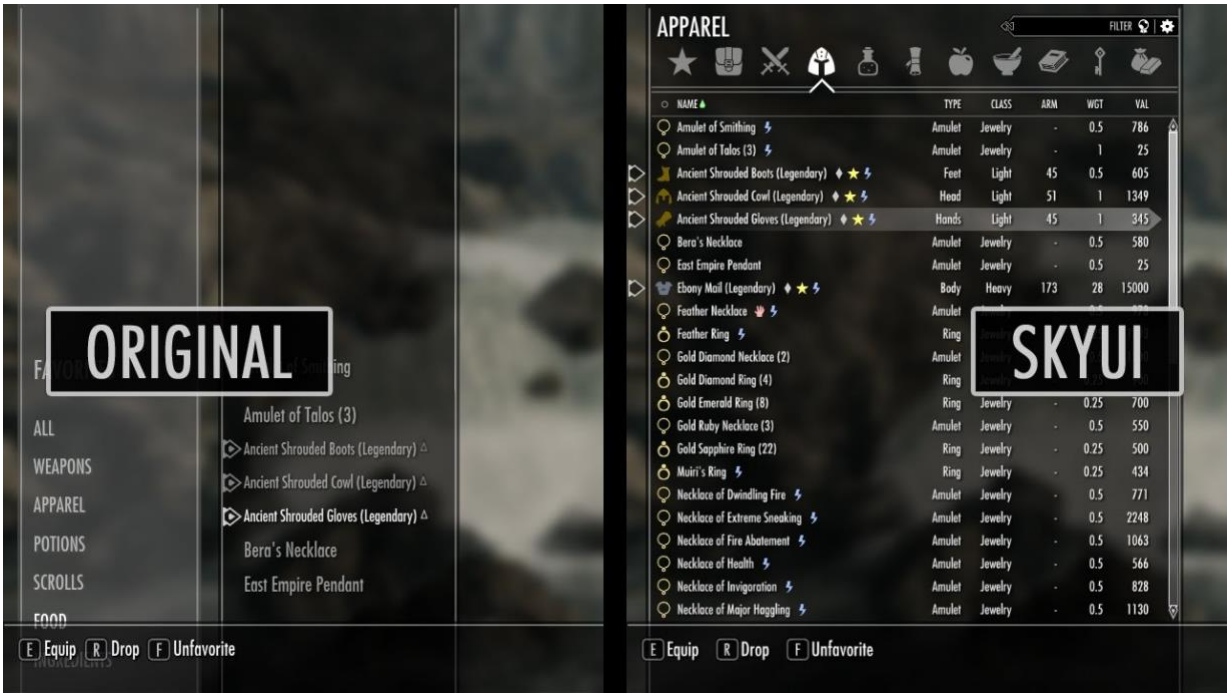

Figure 3. Original Skyrim inventory UI on the left and the SkyUI on the right.

It is the second most popular mod of all time and has 645 dependent mods. The changes it enacts center on a players' ability to see metadata about items in the game. For example, whether or not an item is marked 'stolen,' which has game mechanic consequences; if it is enchanted, which affects combat mechanics; or if an item is favorited or not, etc. It also includes usability elements, like icons next to each item, allowing long lists to be scanned more quickly. Finally, the most notable change is that this mod introduces the ability for players to search their inventory. If a player has the mod that removes the weight limit for the player's inventory, there could potentially be thousands of items in that system, and being able to locate a single item quickly is integral to game "flow." Below (Figure 4) is another feature that is essential to game flow: the favorites menu, which is meant for quick access during combat. The original, like the main inventory, does not include icons of any sort nor does it show status effect

symbols. The SkyUI menu does include symbols, not only to show status effect but also to allow the user to organize and filter their 'favorites' by item type.

Figure 4. The original Skyrim inventory on the left and the SkyUI redesign on the right.

It seems apparent that, when held up to current professional heuristics, the original Skyrim User Interface would not fare as well as SkyUI. Neilsen and Normans' 10 Heuristics for Usability, for example, show SkyUI as a superior interface through its inclusion of elements like 'visibility of system status,' 'user control and freedom,' 'error prevention,' 'recognition rather than recall,' and 'flexibility and efficiency of use' (10 Heuristics for User Interface Design). The customizable experience offered by SkyUI easily explains its 18.5 million downloads and 646 dependent mods. Three of the mods on the top 50 list are themselves dependent on SkyUI to function. This case not only shows just how impressive and improved fan designs can be, it shows that when experience design is done well in video games, it enables and empowers other designers to build off of that existing framework. As I mentioned earlier, if video game

developers and producers are trying to reach modders as a market, they should be examining mods such as SkyUI to improve the user experience and better understand the community affected by it instead of simply advertising to those fan creators.

ApachiiSkyHair Mod

"New Female and Male Hairstyles for Humans, Elves and Orcs. Converted hair from Sims2 and Sims3."

-Nexusmods.com

The ApachiiSkyHair (or "SkyHair" for short) mod is the fourth most popular *Skyrim* mod and has 518 dependent mods. As far as UI changes, SkyHair does not offer much itself; it just imports hair models from the games *Sims 2* and *Sims 3.* This change addresses a major failing by the video game industry: representation. When *Skyrim* was released just under a decade ago the game industry was repeatedly failing to represent those in minority groups. Not only were women, people of color, and disabled individuals rarely represented in video games the little representation that they did have either relied on stereotypes or was only a throw away effort to apease those who spoke out. This mod appeals to many who were not otherwise represented in video games. It attempts to appeal to a feminine audience by introducing promotional material in the magazine genre, shown below in Figure 5. And offers material for players of color by offering more inclusive and representative hair options as shown below in Figure 6.

Figure 5. A mock magazine cover with a photo of a modded character with blue hair and headlines pertaining to the content offered.

Figure 6. A skyrim character who has non-default dreadlocks. In the base game there is only one option for dreads but SkyHair adds a few dozen.

To understand why SkyHair has accrued so many dependent mods, we must consider the network of modding happening around it. SkyHair is itself a dependent mod, and the mod it depends on, "ShowRaceMenu Precache Killer," *does* change the

UI. As shown below in Figure 7, compared to the original avatar creation page, this UI increases the affordances of the character creator.

Figure 7. Screenshot of the original Skyrim character creation interface.

Figure 8. Sreenshot of the character creation interface as changed by ShowRaceMenu and SkyHair. Similar to SkyUI, this menu has added features including symbols, colors, number of options, current setting, and more.

Similar to SKYUI, ShowRaceMenu—and by extension ApachiiSkyHair—adds icons, search capability, visibility of system status, user control and freedom, and other highly recommended usability practices. These elements are all drawn from Nielsen and Norman's Top 10 usability heuristics, which are widely recognized as the fundamental basics of producing a usable online experience. Before these mods the games' character creation interface, inventory, and other similar menus were somewhat usable but often unintuitive, confusing, inaccessible, and text heavy. Once those usability issues are no long

Additionally, the mod gives the user more control over the system, with robust camera positioning options so that the user may take better pictures of their avatar. And while the 'sex' option is still binary, the player is able to adjust the body of their character in so many new ways that they are not as restricted to gender stereotypes around body types. Another change is that the players are no longer strictly held to race presets; previously if someone wanted to play as a black character, they were presented with one option: choose the race that allows for that skin color. This race preset gives their character specific stats and makes them an outsider in the lore of the game, even triggering NPCs to make comments on their race when they encounter the player. These mods allow the player to choose whichever ability bonuses they'd like and then build a unique avatar on top of that, no longer limiting their options or forcing them into a specific social standing in the game. As mentioned above, this type of racially based character build is unnecessary and perpetuates racial stereotypes. This mod, and others like it, allow certain players to break through the systemic racism

programmed into the game by altering the metadata of a character's race and appearance.

While ShowRaceMenu introduced the newly designed functionality and SkyHair brought the new content (the hair models), it is SkyHair that has the dependent mods. This suggests that it is not simply function or content that empowers the dependent mod designers, but more likely an effective combination of the two. On top of content and functionality, there is also the question of awareness when it comes to mods. Mods have been a consistent feature of video game media and owe much of their popularity to that online content.

Content like machinima (fan created animated videos using video game engines) and the thousands of how-to modding videos on YouTube are responsible for the level of awareness mods have reached in the past decade (Scacchi 2010; "No Middle Sliders"; Chien 2007). ShowRaceMenu and SkyHair are very similar to our next mod, RaceMenu, in functionality and in aesthetic but have different audiences associated with this media attention. Specifically, while SkyHair seems to allow for more 'attractive' avatars, this next mod is more broad in its applications.

RaceMenu Functionality

"Complete overhaul to the character creation menu including new customization features such as multiple RGBA warpaints, body paints, hand paint, and foot paints."

-Nexusmods.com

Similar to ShowRaceMenu in function and name, RaceMenu is an extended character creation interface that boasts 553 dependent mods. RaceMenu, like SkyUI

and ShowRaceMenu/SkyHair, offers extended UI functionality in terms of user control. Figure 9 shows a UI within RaceMenu that allows the player to adjust each individual node on the mesh for their avatar; this would also allow them to create non-player characters (NPCs) to port into the game.

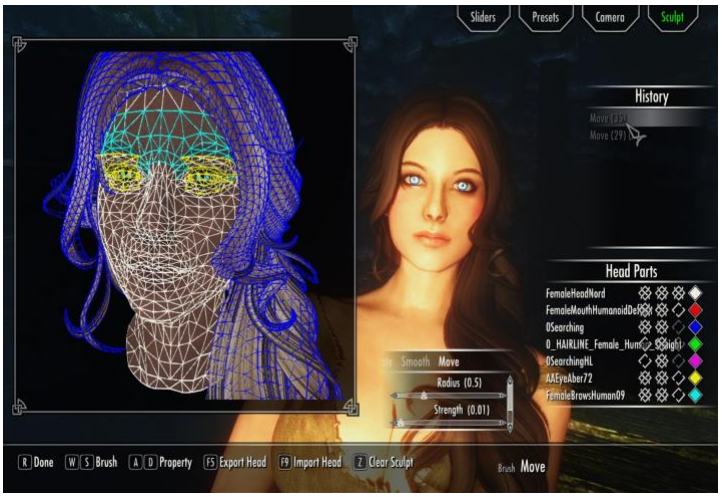

Figure 9. Screenshot that shows the menu unique to RaceMenu, which allows the player to manipulate individual points on the character mesh.

Figure 10 shows the general menu for avatar customization. Unlike SkyUI and SkyHair, RaceMenu does not introduce symbols into the interface, but it does extend the options for avatar customization well beyond the original affordances. For example, similar to ShowRaceMenu and SkyHair, RaceMenu allows players to select a specific RGB color instead of limiting their options to a set of predetermined options.

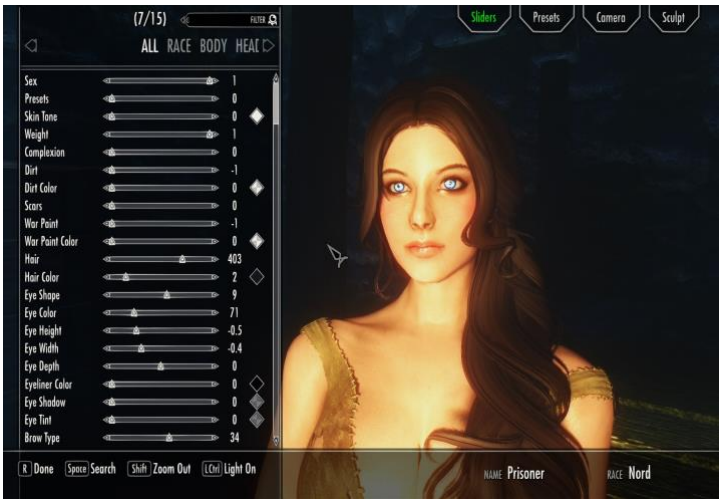

Figure 10. The RaceMenu UI, which is similar to ShowRaceMenu. It expands the options for players to completely customize the mesh of the character model, but it does not use symbols as the other two mods do.

This extended UI includes usability elements such as increased user control as well as freedom and flexibility of use. To reiterate the results drawn from the last example, a combination of improved interaction design with high definition visual content was responsible for the resulting dependent mods, as well as the significant number of downloads between the three mods examined in this paper. Far and away the most frequent type of dependent mods were painstakingly designed avatars, usually made to resemble characters from other pieces of media. Pictured below, Figure 11 shows one of the dependent mods of ApachiiSkyHair, which adds Galadriel from *The Lord of the Rings* as a companion NPC. For those who may not know, Galadriel is a considerably powerful elf queen and her inclusion gives the player a chance to travel the world of *Skyrim* with a companion who is a more interesting character than any of the companions provided in the base game.

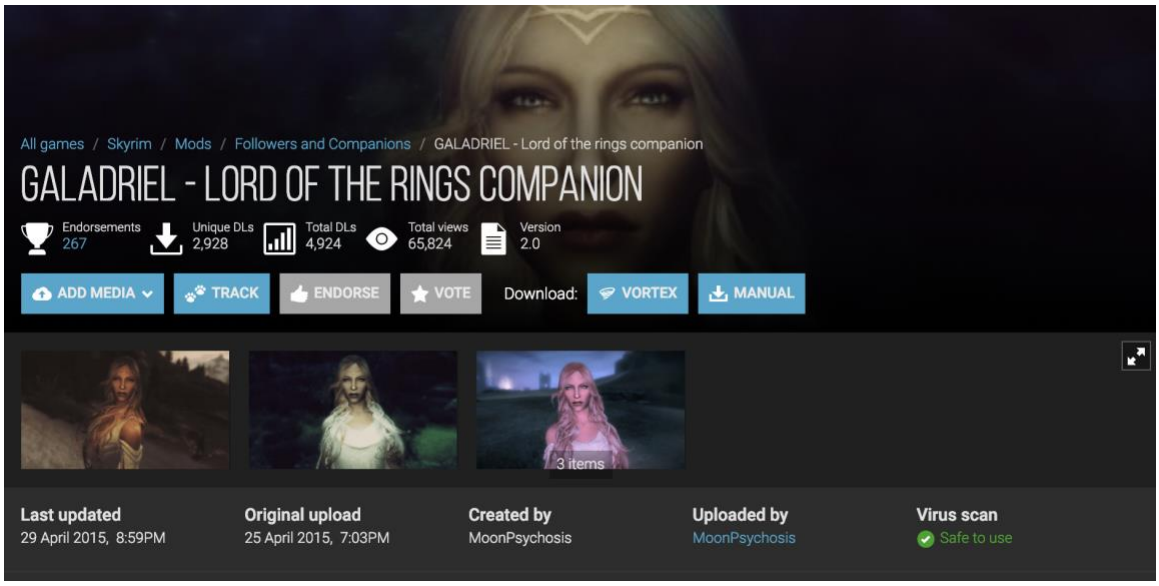

Figure 11. Mod page for a mod titled "Galadriel - Lord of the Rings Companion," which has almost 3,000 downloads and was created in 2015.

However, this mod contains intellectual property from a series that is not associated with Bethesda, the studio that produced *Skyrim*. As such, it is something that could not be sanctioned by the official developer due to copyright infringement. However, modders are already used to not being able to make money off of their creations. While paid mods were a possibility labor and copyright issues quickly became too risky for the companies involved and did not last. Because of this modders are free to engage in this remix practice. The combination of the players' media knowledge with the structure to incorporate it into one of their favorite games is what inspires this networked co-creation. The lists of dependent mods for SkyHair and RaceMenu are filled with characters from books, popular culture, movies, and TV, including four Jon Snows, Hermione Granger, Geralt from the *Witcher* series, and Aubrey Plaza the actor known for *Parks and Recreation* (Jon Snow Racemenu preset; Hermione Follower and Savegame; Geralt of Rivia Racemenu Preset; Aubrey Plaza Preset - Racemenu).

This list tells us something about the unofficial nature of modding: it involves remixing in ways that the original game developers cannot do. It is not simply about improving the UI or undermining the content, it is about remixing and playing with the mechanics and the aesthetics to create a truly unique, fan-driven experience. Neither game developers nor modders could accomplish this culmination of media knowledge and technical skill on their own. It is by necessity a participatory design practice. Though game designers and developers cannot provide this meta content themselves, they can build a system that allows modders and other end users to customize and remix their content and engine to better suit their wants and needs.

CONCLUSION

In all three of the modding cases presented above, the structure and functionality put in place by the modder allowed other players to develop new materials and new narratives within the game. Developers hoping to leverage the experience of gamers as designers should apply the methods and insights in this paper to better understand their audience. A deep dive into the existing participatory design practices of this community is helpful for those who want to attempt to implement participatory design in video game development, as well as those who are simply interested in learning more about their user base. From simple UI design changes to infinite possibilities for a characters' avatar, these modders have cultivated a community of design. So while serious games researchers and AAA game developers tend to rely on UX heuristics, the method presented here aims to expand the scope of that involvement. A more robust and research based approach that focuses on gamers as participant designers in game development is not only possible, but such a move would signal their support of their gaming communities.

Examining the current co-creation and co-design practices of these communities will improve our implementation of UX design methods to make them more productive and more conscious of the potential impacts on those communities. Understanding existing participatory practices allows designers and developers to see **what** is happening so they can delve into **why**. Future research on this subject should work towards a more holistic approach to UX in video game development with the aim of connecting and aligning disciplines, departments, and institutions. Future work must

move beyond critique to include initiatives that help UX professionals, serious game developers, and entertainment game developers collaborate with modders and other fan creators. The power differential between those groups hinders the design of a good system or game, as we saw in the original interfaces which were clunky, hardly usable, and were nowhere near providing users with the control they wanted. Understanding that designers need players just as much as players need designers will bring us closer to a productive *community* participatory design.

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