

Key Aspects of Game Design Research – A Scoping Review

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ABSTRACT

This extended abstract presents the research process, aims and first results of a literature review of publications on game design. In an ongoing qualitative and iterative study, proceedings of three major game conferences were carefully analyzed for distinct principles and aspects of game design. The main objective is to provide a holistic perspective on the state of a research area which is rapidly growing and transforming. Single sources were added to the pool of reviewed publications to account for multidisciplinary overlaps between game design and other fields of research. Publications were furthermore screened for research gaps to create an overview of undiscovered topics. The aim is to give an exhaustive taxonomy of game design research publications as well as research gaps. Key research areas we identify are; *design aims, design process, serious games, forms of representation, character design, game design taxonomy and ontology, gameplay, gamification, narratology, social interactions in play and game analysis.*

Keywords

game design, literate review, research gaps, taxonomy

INTRODUCTION

The selection process for relevant articles was conducted with respect to three research questions:

- With regards to which key aspects is game design research currently conducted?
- What do the identified key aspects add to the knowledge state of game design and game design research?
- Which research gaps are identified by scientific literature?

METHODOLOGY

The methodology which is used for this literature review borrows from scoping review frameworks. The iterative approach consisting of five steps by Arksey and O'Malley (Arksey, O'Malley, 2015) as well as the best practice recommendations by Levac et al.

Proceedings of DiGRA 2020

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including the optional step of external consultation (Levac et al., 2010) served as the basis for the used methodology. Adaptations were made to account for researcher availability and existing resources, as can be seen in *Figure 1*. As a reporting framework, the 22 PRISMA items for scoping reviews (Tricco et al., 2018) are used.

In an a priori protocol article inclusion and exclusion criteria were defined. After the completion of the a priori protocol literature was collected as potential sources and references with meta information were saved in a relational database for further processing. Therefore, publications of three popular game research conferences (*International Journal of Computer Games Technology*, *GAME The Italian Journal of Game Studies* and *Digital Games Research Association*) were scraped and imported into a literature database. The selection of conferences was based on the input of an external advisor as well as the sources lists of two meta reviews (Melcer et al., 2015 & Martin, 2018) as well as the amount of publications per conference which had to match the available time resources. Two researchers independently screen all potential sources for novel aspects of game design and research gaps by analyzing titles and abstracts. At the end of the screening process the proposed inclusions / exclusions are saved in a database for each researcher. Based on these discussions, the criteria for inclusion and exclusion from the a priori protocol is further refined. For data charting PRISMA diagrams are created as can be seen in *Figure 2*. The reporting in textual form is done by a single researcher, whereas an interactive web-based representation of the findings has been created in a team effort.

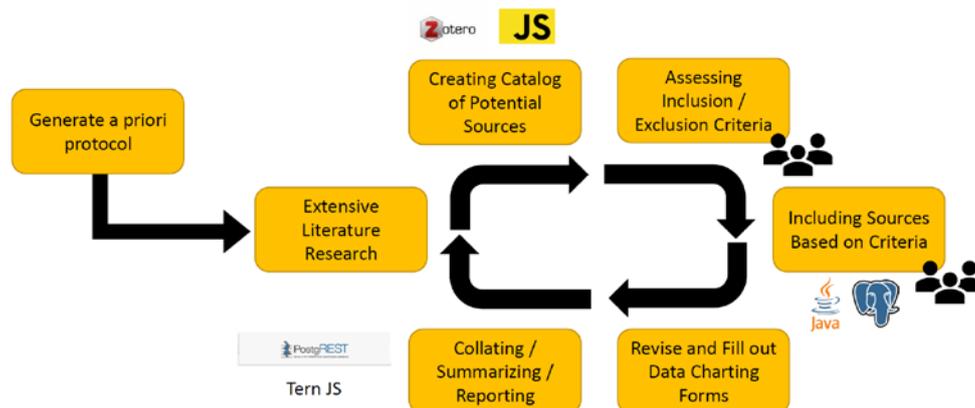


Figure 1: This is a diagram of the used methodology. The people icon represents steps conducted in a research team. Other icons represent software used within the research progress.

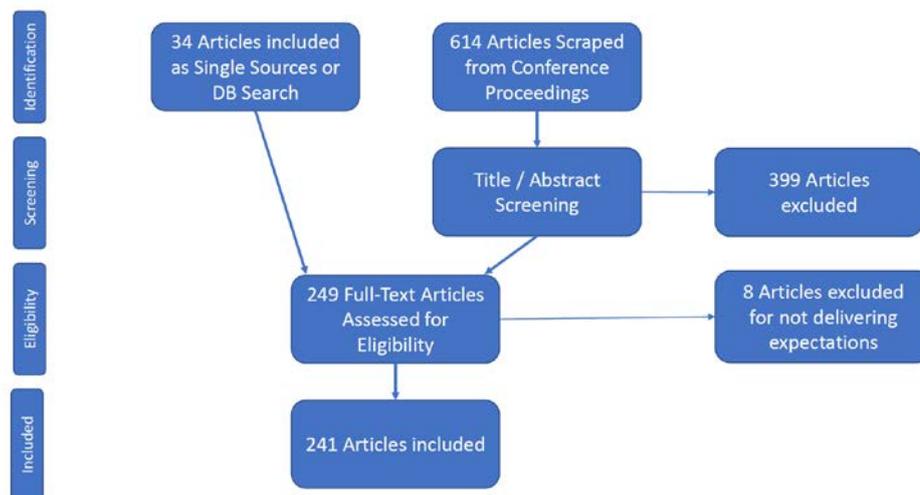


Figure 2: PRISMA diagram of the articles examined and included / excluded throughout the research process.

CURRENT RESEARCH STATE

The literature review is currently in its final iterations and nearly finished. As can be seen in *Figure 2*, a total of 241 / 648 articles (37%) were considered crucial and/or novel contributions to the state of game design research.

The currently included publications represent game design aspects, which are considered knowledge that is usable when creating a video game in this scope, if they either contain a completely new concept or if they extend an existing concept. Furthermore, publications on research gaps are included. Technical implementations and mere applications of game design aspects, e.g., field studies of a game-based learning technique, are generally excluded.

FINDINGS

The following main research categories were extracted from the included articles: *design aims, design process, serious games, forms of representation, character design, game design taxonomy and ontology, gameplay, gamification, narratology, social interactions in play and game analysis*. This given list represents a taxonomy of key aspects in game design research and provides insights regarding the first research question.

For each abovementioned category there are at least four subcategories with corresponding publications. It is beyond the scope of this extended abstract to list novel aspects of each publication. An example for a subcategory, which extends the knowledge of a main category would be *representation of inaction in video games*, which adds to the knowledge state of *forms of representation*. A complete list is obtainable at <https://litrev.abendstille.at/concepts>. It is still subject to change.

A wide variety of research gaps was identified in the analyzed publications. They were divided into the following seven categories *Design Aims, Game Analysis, Social Interactions in Play, Design Process, Serious Games, Gameplay and Character Design* and range from *matchmaking based on player ethics* to *genetic manipulation of cells for biotic games*.

It is essential to point out that this taxonomy is merely an opinionated recommendation for a categorization of game design research.

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