Iterative game design in education

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Abstract: Educators should impart principles of iterative game design to their students as a best practice. Iterative processes allow player feedback to systematically inform design decisions. However, the constraints and conventions of academic practices pose several challenges for the adoption of iterative processes. Many students lack the confidence in their own abilities and the discipline to work in short iterations. A constant stream of testers is necessary for iterative design and providing that stream requires advance planning. Misinterpreting tester feedback can badly hurt morale. Finally, the tendency of both game development and academia to focus on a finished product may actually distract students from practicing the habits needed to conduct effective iterative design. Based on the student projects of the Singapore-MIT GAMBIT Game Lab, this short paper looks into each of these challenges and proposes some potential solutions for introducing iterative game design in a higher education context.

Keywords: iterative design; game design; game development; Singapore-MIT GAMBIT Game Lab; curriculum development; design curriculum; best practices; higher education; mentorship; toy design education.


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1 Introduction

Thoughtful application of mentorship principles and project management methodologies can be beneficial for students enrolled in game development programs. Employing the
concept of legitimate peripheral participation (Lave and Wenger, 1991) to introduce new students to the various testing disciplines of game development has helped to improve the student understanding of multidisciplinary processes (Fernández-Vara and Verrilli, 2009). Combining cognitive apprenticeship models (Collins et al., 1990) of situated learning theory (Wertsch, 1985) with Agile software development practices (Schwaber, 2004) has better aligned academic and professional workflow and raised the overall quality and reliability of games developed by the Singapore-MIT GAMBIT Game Lab (Fernández-Vara and Tan, 2008).

Introducing industrial best practices into academic settings requires adjustments to academic expectations and class scheduling. Based on the outcomes of 25 projects within the Singapore-MIT GAMBIT Game Lab, this short paper examines the process of introducing one specific practice, *iterative game design*, in the context of higher education.

2 The practice of iterative game design

Zimmerman and Salen describe iterative game design as “a method in which design decisions are made on the experience of playing a game while it is in development” (Salen and Zimmerman, 2003, p.11). Iterative design is an investigative process closely modelled on the scientific method. A game designer evolves an already functional or rapidly prototyped game by identifying problems through repeated testing, amplifying desirable aspects of gameplay and compensating for or removing problematic components of the game system. It allows game designers to play a game critically and implement changes that push the game towards meaningful play (Salen and Zimmerman, 2003).

Although not universal, iterative design is common enough in professional circles that institutes of higher education may choose to impart it as a best practice to their students. From the viewpoint of the student, iterative game design illustrates the value of early player feedback and informs the decisions of a designer.

The job of a game designer is to craft rules that result in desirable experiences for players. However, when people play a game, they do not encounter each rule in a vacuum. Instead, players experience multiple rules acting in concert, operating as an emergent system to enable ‘meaningful play’ as defined by Huizinga (1949). Furthermore, different players enjoy games for different aesthetics such as challenge, narrative or fantasy (Hunicke et al., 2004). For example, a game intended to elicit a certain type of experience (e.g. a three-legged race as a test of coordination) in fact may be more enjoyable when viewed in a different light (e.g. humour and spectacle).

The necessity for disciplined testing is further amplified in development teams, where many people of specialised artistic or technical strengths implement different components of a game, and no single member of a team can fully anticipate the outcome of their combined changes. While veterans can make educated guesses, their intuition is still limited to experiences and systems similar to what they have developed before.

Therefore, when a game designer makes a change to a game system, it is impossible for him or her to accurately predict whether players will enjoy the resulting experience (Salen and Zimmerman, 2003, p.168). Knowing that their abilities to ‘predict fun’ are limited, game designers have to rely heavily on playtesting to reveal elements in their games that are enjoyable or frustrating. Seasoned game designers conduct playtesting
even when the game is far from mature. By having others play scaled-down prototypes and paper mock-ups, game designers glean useful feedback that serves as a catalyst for innovation and improvement.

If structured testing is necessary in order to identify and verify the effect of game design decisions, an additional structure must also be put in place to feed test results back into the design process. Not only is it a waste of effort to continue designing a game in a direction that players find unengaging, a smart game designer needs to have a means of detecting and capitalising on happy accidents. In one example from our projects, different players would interpret instructions for a photo-taking game in very different ways, resulting in incongruity when pictures were viewed side-by-side. Such feedback was an opportunity to encourage even more creative and bizarre interpretations.

3 Implementation in curricula

For an educator, integrating iterative design into a curriculum for game design has its benefits, such as regular opportunities for assessment and mentorship, early evaluation of student decisions and informed management of project scope. However, the constraints and conventions of academic practices pose several challenges for the adoption of iterative processes. The rest of this paper discusses common issues and suggests possible approaches for negotiating the clash between academic contexts and professional best practices.

3.1 Rapid iterations require confidence and discipline

Iterative design expects developers to have the ability to conceive, mock-up and implement workable solutions very quickly. Students new to game design often do not have enough confidence in their design skills to be able to create iterations of their game under time pressure.

This problem is amplified when teams are large. Such is the case at the Singapore-MIT GAMBIT Game Lab, where teams typically range from seven to ten students from different disciplines including art, music, game design, testing, programming and management. Students new to iterative design have the tendency to perceive each deadline as the last word on design or features, not just as another step in a cyclical process. Without confidence in their own skills and in the process, students vie to have their ideas given priority and extra development time, worrying that low-quality work may result in their contributions being entirely removed from the game.

The practice of iteration comes more naturally in circumstances where no additional materials need to be developed in order to adjust and play a game. In a multidisciplinary context, particularly in a digital game program, instructors should emphasise rapid paper and live-action prototypes of games before beginning the more planning-intensive effort of digital game production.

Alternatively, a course focusing on the discipline of game design can have students focus on shorter projects, designing schoolyard-style games or parlour games using well-known implements such as poker cards. Small groups of players, short play times and familiar game items reduce the amount of effort between concept work and playtesting, allowing students to get started and gain confidence in the process quickly.
3.2 Tester recruitment is necessary and time-consuming

Game designers quickly become so familiar with their game that their personal opinion of any iteration becomes biased and unreliable. By knowing every detail of the game, designers learn and internalise shortcuts and strategies that first-time players would rarely discover. Thus, tests increasingly need to be externally verified against new players in order for their feedback to be valid. However, organising such test sessions can be extremely time-consuming.

For the Singapore-MIT GAMBIT Game Lab’s nine-week development cycle, external assessment needs to begin by the start of the second week at the latest, but the students cannot be expected to recruit external testers when the majority of the Singaporean students in Boston are still acclimatising to work in a different country. In our case, the initial effort of coordinating and providing external playtesters falls on the shoulders of teaching staff, who have months to prepare before the students begin the program.

Instructors can pass the responsibility of external tester recruitment to students relatively easily, once students have experienced the benefits and process of testing. Providing students with a predetermined schedule of testing at the beginning of a program encourages students to scope their projects so that they can be feasibly implemented between the beginning of a project and the first scheduled test. The resulting projects are often more amenable to feedback and change between iterations.

3.3 Conflicting feedback affects morale

A side effect of iterative development is the early availability of feedback regarding problems and frustrations with a game. While professional game makers see the value of these early warning signs in avoiding costly rework, students without a track record of successful game design and development may not have the confidence to interpret negative feedback in a positive light. Instead, they may take early negative feedback as an assessment of their own abilities and their value as game designers.

Early-stage projects are also necessarily amorphous. Playtesters may interpret the low-cost quality of paper mock-ups and sketches as an invitation to propose wildly ambitious or contradictory feedback, illustrating the many possible directions in which a project could proceed. This can result in confusion on the part of student game developers as they see expectations of their projects inflating before their eyes. In one early student prototype at the Singapore-MIT GAMBIT Game Lab, testing feedback from three experienced game professionals yielded different visions of what they imagined the game could be. The team floundered while it fought over each of the possible alternatives, losing its focus on the concepts that had initially helped to bring the team together.

If both the students and the testers are inexperienced, the time-consuming process of testing with people outside of the team is soon seen as a waste of time rather than an essential process. For early tests, instructors should put students in contact with informed testers who are familiar with both game design and academic constraints and who can give directed and positive feedback. All early feedback for a given project should also be delivered in the presence of a consistent instructor or through a mentor assigned to a team, providing a moderating influence on conflicting opinions from different testers.
3.4 Artefact focus can be detrimental

It is difficult to observe the degree to which a student understands a process. Academic instructors tend to base their assessments of students on the quality of artefacts created by the students (e.g. term papers and final exams). Game design also has a tendency to emphasise the artefact: the game itself. In game design projects, students will naturally take ownership and pride in their game. The temptation is strong for a student to take shortcuts in the process for the sake of increasing the perceived value and complexity of the game. Because it is technically possible, though unlikely, for students to produce a workable, functional game without conscientiously employing iterative design, a focus on the artefact may also lead students to consider significant and unsustainable last-minute efforts to be a suitable replacement for consistent adherence to the iterative process.

Such habits, endemic in pre-university academic practice, are difficult to break and are unsustainable in a professional career. However, students may only realise their errors once they receive their final grade. Not only does this waste an opportunity to practice sustainable working habits, such late realisations often result in disappointment, confusion and little else to show for their efforts.

Instructors teaching iterative development should emphasise the cognitive value of the process. If the intent is to teach best practices in design, no assessment of the game itself should be a factor in the final grade. Instructors should instead assign grades based on the student’s understanding of the process. This should be made clear to the students at the beginning of the project. In addition, early and ongoing feedback is essential for drawing the attention of students to the importance of the process. Mid-term grades allow instructors to reinforce the discipline of iterative design, and they can be highly effective even if not factored into a student’s permanent record, encouraging them to make changes in their working habits.

4 Conclusion

While regular testing and iterative design are useful practices for any game designer, educators intending to incorporate them into a game design curriculum need to look closely at the expectations of their academic environment and their students. Many of the difficulties of integrating iterative processes in the classroom are a result of the differences between academic and professional contexts. However, if students and instructors are willing to be flexible, they can quickly grow comfortable with iterative design and reap the benefits of early player feedback, informed decision making and better-designed games.

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