

## 2014 Budget Form – President’s Performance Fund

**New Mexico State University**  
**New Initiatives Supporting Vision 2020 Goals and Objectives**  
**For Allocation of President’s Performance Fund – Fiscal Year 2013-2014**

<b>Date of Request:</b>	Sept. 17, 2013	
<b>Submitted By:</b>	Zachary O. Dugas Toups	Phone: 575-646-1605
<b>College or Unit:</b>	College of Arts & Sciences	
<b>Department:</b>	Department of Computer Science	
<b>Project Name: (Short description): Making the Game Development Club Self-Sustainable</b>		
<input checked="" type="checkbox"/>	<b>Recurring for:</b>	<b>Amount Recurring Funding Requested per year:</b>
	<input checked="" type="checkbox"/> <b>One Year</b>	<b>Year 1: \$16,100</b>
	<input checked="" type="checkbox"/> <b>Two Years</b>	<b>Year 2: \$10,100</b>
	<input checked="" type="checkbox"/> <b>Three Years</b>	<b>Year 3: \$6,650</b>
<input type="checkbox"/>	<b>Non-Recurring</b>	<b>Amount Non-Recurring Funding Requested: \$</b>
<b>Description of request</b>		
<p>Game design attracts students to STEM and artistic fields, retains them through the opportunity to do exciting work, and boosts gender balance, yet NMSU offers few options for students interested in game design. Game mechanics, the moments in play where the player makes a decision and the system reacts through its rules [5], are the <i>lingua franca</i> of the new generation of students. The systematic and information-centric nature of games addresses computer science and engineering directly, while the narrative and social nature of games invokes the arts and broadens the appeal of STEM. Game design opens opportunities to address difficult STEM problems in the context of human-centered computing, social computing, narrative, visual art, and design. While games serve as valuable teaching tools themselves [3], game design is a difficult and rewarding educational enterprise. Success requires creativity and complex system engineering.</p> <p>The <b>Game Development Club (GDC)</b> enables students to learn game design and development skills, work together in a team, and build a deep understanding of STEM and artistic topics by applying what they learn in class to a long-term project. Students in the GDC work together to collectively develop at least one game over the course of the year. While students volunteer their time and make use of the free resources available to them, game development has costs. With a grant from the President’s Performance Fund, we aim to make the GDC self-sustaining by creating new intellectual property, forming a permanent library of development and creativity support materials, and advancing the GDC’s standing on campus to ensure a sustainable influx of students to the club. Through the activities of the club, we will advance NMSU’s Vision 2020 by improving graduation rates [<b>Goal 1</b>], diversity [<b>Goal 2</b>], research and creative activity [<b>Goal 4</b>], and economic development [<b>Goal 5</b>].</p> <p>With funding from the President’s Performance Fund, we will undertake a number of activities in the next three years. We will begin by developing feature-complete games, at least one per year. Once a game is feature-complete, we will work with the Arrowhead Center to develop a commercialization plan and profit share with the university. As our program progresses, we will investigate the use of new technologies in game play. This will result in a number of experimental games, which may or may not enter the commercialization process, but which are expected to be worked into papers and presentations. Over all three years, we will bring in outside speakers from the games industry to NMSU to give lectures on game design. This will benefit the club specifically by bringing in new members, while enhancing learning for the whole campus.</p>		

### Meeting Vision 2020 Objectives

The primary focus of the GDC is to develop games in a team environment using the latest in software and hardware technologies. GDC enables students to develop skills outside the classroom, reinforce what they have learned, and gain experience working and communicating with a team. Students will graduate NMSU with a set of interdisciplinary skills that are valuable in any job. GDC students will bring with them a portfolio of work that will demonstrate to potential employers their skill and the value of an NMSU education. At the same time, the creative output of the club will produce new research and intellectual property for the university.

We expect that involvement in the GDC will improve graduation rates for students in STEM disciplines and the arts [Goal 1 / KPI 1]. Students will find an exciting and creative use for their classroom learning, and be motivated to complete their education. They will be better prepared for the job market after graduation, helping them to understand the value of graduating.

Game development is an interest that spans multiple backgrounds [5] and shows a growing female population [1], which is at odds with STEM aspirants, who are on average 69% male [4]. Gaining experience in game design will enhance retention and gender balance at NMSU. The GDC is closely affiliated with the Computer Science Department, but draws majors from the Creative Media Institute, who are vital to designing the artistic elements of good games, as well as the College of Engineering who appreciate any technical challenge. GDC membership is made up of both male and female students of different ethnicities; nonetheless, we believe that the GDC’s diversity could be improved. By hosting events that highlight the value of the GDC to the campus community, we expect to draw in a more diverse group of students [Goal 2 / KPI 5], and ensure that those students maintain their interest in their education [Goal 1 / KPI 1].

Game development is a technology-intensive field, where innovation happens frequently, in addition to being highly creative. The GDC is committed to building games that incorporate the latest technologies, from virtual reality (the Oculus Rift headset, the Omni treadmill sensor), to touch interfaces on mobile devices, to mixed realities where the player enacts game play in real life. The GDC will develop a number of experimental games, some of which incorporate novel technologies [Goal 4 / KPI 9]. At the same time, this work will be highly publishable in the game development and human-computer interaction literature [Goal 4 / KPI 9].

As the GDC develops feature-complete and experimental games, these creative works will serve as new intellectual property (IP) and form the foundation for the GDC’s ultimate self-sustainability. The GDC is unique among student organizations in that its primary focus is to teach its members how to create software that could potentially generate \$1,000,000’s. Games developed as a club effort are not intended to financially benefit any individual participant, but the club and university. Developed games will be commercialized through the Arrowhead Center [Goal 5 / KPI 12]. The income from the GDC’s commercialization efforts, as a profit share with NMSU, will serve to fund the GDC in future years.

Game developers often produce startup studios; with funding from the grant, the GDC can help entrepreneurial students get a head start on creating their own development studios, as well as help students learn skills crucial to working in the game industry and beyond. As more students are involved in the club, it advances the number of participants involved in commercialization efforts at the university [Goal 5 / KPI 13].

### Budget Justification

Game design is a creative process that requires a multidisciplinary approach. It builds on the latest technologies. In addition to developing games, we aim to increase enrollment in the club and improve its standing on campus.

We will use grant money to fund an ongoing set of equipment. High-end Apple iMac workstations will enable students to develop for a range of operating systems and devices, while being able to create graphics and sound assets for use in games. We will acquire a sampling of the latest gaming technologies, enabling students to develop for virtual realities, mixed realities, and mobile environments, as well as the most recent gaming hardware. This will support club members in developing games that can later become IP, while preparing students with an impressive skill set for the future workplace.

To support the creative process, understand existing designs, and develop students’ knowledge, we will build a library of materials to support GDC students. We will collect books on game design, programming, and other related topics. The GDC will curate a collection of games, both digital and board, to serve as inspiration and to enable students to better understand a range of game designs and mechanics. As digital game design frequently begins with board game design and benefits from low-fidelity prototyping, we will build a collection of reusable materials that can be used throughout the development process for these purposes.

Increasing enrollment in the club is a priority, to improve graduation rates and diversity. We intend to use part of the requested funds to bring a guest speaker to campus to address NMSU students. We hope to attract influential game designers from the industry. A guest speaker will generate student interest, while teaching students more about game design.

### References

1. ENTERTAINMENT SOFTWARE ASSOCIATION. Essential facts about the computer and video game industry. 2011.
2. HIGHER EDUCATION RESEARCH INSTITUTE AT UCLA. Degrees of success: Bachelor’s degree completion rates among initial STEM majors. *HERI Research Brief*. Available online: [http://www.heri.ucla.edu/nih/HERI\\_ResearchBrief\\_OL\\_2010\\_STEM.pdf](http://www.heri.ucla.edu/nih/HERI_ResearchBrief_OL_2010_STEM.pdf). January 2010.
3. HONEY, M. A., HILTON, M. Eds. *Learning Science: Computer Games, Simulation, and Education*. National Academies Press, Washington, D.C., USA, 2010.
4. NATIONAL CENTER FOR EDUCATION STATISTICS. *Table 287: Bachelor's degrees conferred by degree-granting institutions, by sex, race/ethnicity, and field of study: 2007–08*. Available online: [http://nces.ed.gov/programs/digest/d09/tables/dt09\\_286.asp](http://nces.ed.gov/programs/digest/d09/tables/dt09_286.asp). June 2009.
5. SALEN, K., AND ZIMMERMAN, E. *Rules of Play: Game Design Fundamentals*. MIT Press, Cambridge, MA, USA, 2004.

**2014 Budget Form – President’s Performance Fund**

Request Justification	
<b>Support Vision 2020 Goals</b> (select as many Vision 2020 goals as apply below).	
<input checked="" type="checkbox"/>	<b>1. Graduation – Teaching, Learning &amp; Programs</b> - Provide effective academic programs, stellar teaching and learning, and enhanced student engagement to advance highly capable graduates
<input checked="" type="checkbox"/>	<b>2. Diversity</b> – Be a model of student, faculty and staff diversity at all levels
<input type="checkbox"/>	<b>3. Internationalization</b> - Effectively prepare students for a global society
<input checked="" type="checkbox"/>	<b>4. Research &amp; Creative Activity</b> -- Be the catalyst for promoting discovery, encouraging innovation, sparking economic advancement, and inspiring creative achievement
<input checked="" type="checkbox"/>	<b>5. Economic Development</b> -- Be a driving force for economic progress in New Mexico
<input type="checkbox"/>	<b>6. Resource Stewardship</b> -- Increase philanthropy and alternative revenue to support teaching, research and service
<input type="checkbox"/>	<b>7. Community - Service, Extension &amp; Outreach</b> -- Be a model for community engagement at all levels through innovative and exceptional outreach activity
<input checked="" type="checkbox"/>	<b>Specific objectives: (Complete attached Performance Data Matrix)</b>

Approvals (please print and sign)			
Submitted by	Zachary O. Dugas Toups Print	 Signature	2013-09-17 Date
Director/ Department Approval	ENRICO PONTELLI Print	 Signature	9/17/13 Date
College Dean/ Division VP Approval	 Print	 Signature	9/27/13 Date

Internal Use Only				
<b>University Budget Committee:</b>	Tier Assignment:	<input type="checkbox"/> Tier I	<input type="checkbox"/> Tier II	<input type="checkbox"/> Tier III
	Ranking No.:	_____	Date:	_____
<b>Comments:</b>				
<b>President’s Academic Council:</b>	<input type="checkbox"/> Approved	<input type="checkbox"/> Disapproved	Date:	_____
<b>Comments:</b>				

**2014 Budget Form – President’s Performance Fund, supplement**

**New Mexico State University  
New Initiatives Supporting Vision 2020 Goals and Objectives  
Performance Data Matrix  
Fiscal Year 2013 - 2014**

The Vision 2020 Strategic Plan provides goals, objectives and key performance indicators for the University. Using the goal(s) you have check marked on the request form, please indicate which of the stated objectives this request is projected to positively impact, how the request is tied to the selected objective and propose a performance measure(s). Then indicate the target performance improvement goals over an annual timeline not to exceed three (3) years. Add rows as needed.

All Presidents’ Performance Fund awards are subject to annual review of comparative performance as a condition of continuing award. The required conditions of continuing funding will be identified at the time of award from the President’s Performance Fund.

Goal #	Vision 2020 Obj.	Explain how request is tied to this objective	Performance Measure	FY2013-2014 Target	FY2014-2015 Target	FY 2015-2016 Target
1	1	Students engaged in the GDC will find their classroom experiences more valuable and interesting. They will develop creative work that will serve as a portfolio in their later job searches. This is expected to boost retention and improve graduation rate.	Number of students graduating involved in GDC during their time at NMSU.  End-of-year survey to assess whether GDC maintained student interest and prepared them for the workplace.  End-of-year survey to assess value of portfolio in job search.	3+ / year  positive response from 5+ students / year  positive response from 3+ students / year	6+ / year  positive response from 10+ students / year  positive response from 6+ students / year	15+ / year  positive response from 20+ students / year  positive response from 15+ students / year
2	5	Game design is appealing across genders and ethnicities. We expect that making the GDC highly visible will encourage students from both genders and a range of ethnicities to join and benefit from the experience.	Gender balance in GDC membership.  Ethnic composition of GDC membership.	at least 30% female membership  at least 3 races / ethnicities represented	at least 40% female membership  at least 4 races / ethnicities represented	50/50 gender balance  at least 5 races / ethnicities represented

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New Mexico State University  
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 Performance Data Matrix  
 Fiscal Year 2013 - 2014

			1 / year	2 / year	2 / year
4	Students in the GDC are expected to produce creative works through game development. As game development is a technology-intensive field, we expect that the GDC will serve as a hotbed for applying new technologies and developing novel game mechanics and interfaces.	Development of feature-complete games.	incorporate new technologies into 0 experimental games / year	incorporate new technologies into 1+ experimental games / year	incorporate new technologies into 1+ experimental and 1+ feature-complete games / year
9		Incorporation of new technologies in experimental games <b>and</b> feature-complete games. New technologies include virtual reality (goggles, treadmill systems), mobile/mixed reality, and/or new input techniques (free-air interaction, touch).	0 papers / presentations with GDC member co-authors / year	1+ papers / presentations with GDC member co-authors / year	1+ papers / presentations with GDC member co-authors / year
5	The GDC exists to develop new games and intellectual property. As part of making the GDC self-sustaining, we intend to sell produced games through the University’s commercialization programs.	Feature-complete games to sell.	0 feature-complete games / year	1+ feature-complete games / year	1+ feature-complete games / year
		Number of games sold.	0 units / year	100 units / year	500 units / year
5	As the GDC is developing new games and intellectual property, the number of participants engaged is directly tied to its enrollment.	Number of students enrolled in the GDC.	10 students / year	15 students / year	20 students / year