

Faculty Development Plan for Years 1-3

Name

The purpose of this document is to set overall goals, analyze current standing and identify target steps for what I want to accomplish during my first 3 years at BYU in the areas of Teaching, Research and Service.

Teaching

Overarching Goal. When I envision the teacher I hope to become over the next 3 years, I hope that my students will describe me and my class by the aims of a BYU education. While I will try to improve my course in all facets of the aims of a BYU education, for the next 3 years I will particularly analyze my efforts and create a plan to improve my teaching in the aims of Spiritually Strengthening and Intellectually Enlarging. Thus, as illustrated in Figure 1, my overall goal for teaching is to increase the level of intellectual and spiritual growth of my students, assessed by the student ratings for these variables. Below I will describe the 5 steps I have identified to help me achieve this goal over my first 3 years at BYU.

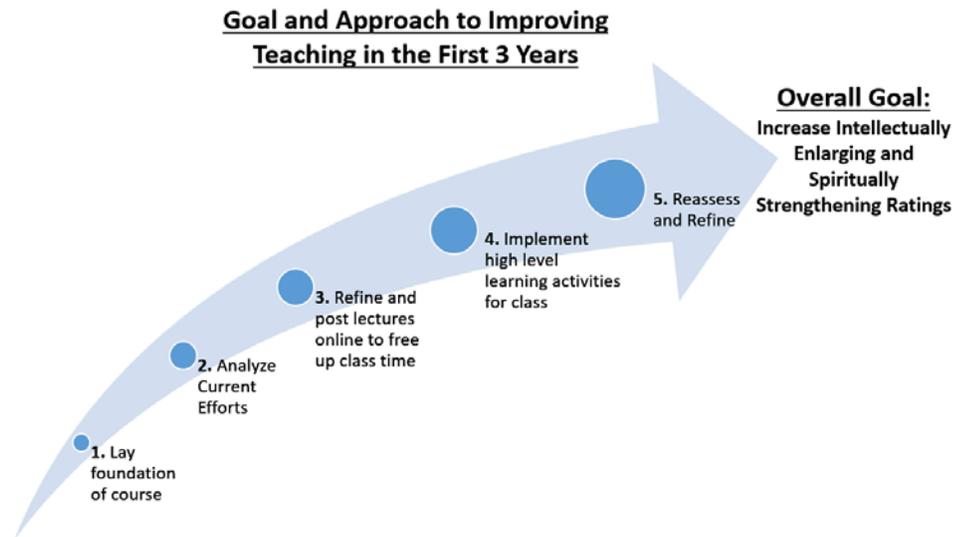


Figure 1. Goals and Approach for Improving Teaching in My First 3 Years at BYU.

1. *Lay the foundation of the course*

- a. Coming in as a new professor my goal was to develop the key elements of my class. Over the past two semesters I have identified important learning outcomes and have created foundational teaching strategies and assessments for these outcomes. With the foundation of my course laid (presentations, quizzes and tests) I am now ready to make a more concentrated effort to make my course more Intellectually Enlarging and Spiritually Strengthening.

2. *Analyze Current Efforts*

- a. With two semesters of experience, I now have useful feedback (student reviews) and data (scores or tests and self-reported studying strategies) from my students to guide my efforts for making the course more intellectually enlarging and spiritually strengthening.
- b. Student Reviews Regarding Intellectual Growth
 - i. As I have studied the reviews of my class I have found that most students (~82%) report that my class “strongly enhanced Intellectual Growth”. Based upon student comments, my effort to get to know my students and ability to explain complex concepts simply has attributed to the success of the class. While these ratings and feedback are great, I have observed in student comments that the growth is partially limited by having much of the first part of the semester is merely a review from previous courses. While to some extent this review is necessary, it seems to cause some students to disengage at the start of the course, subsequently missing out on new concepts and applications that will foster greater intellectual growth. As will be discussed later, I plan to address this issue by posting some review lectures online, thereby opening up class time for more engaging and growth promoting activities.
- c. Student Reviews Regarding Spiritual Growth
 - i. Sixty-three percent of Students from my first semester reported that the course “Strongly Enhanced” Spiritual Strength. In my first semesters I attempted to have the overarching theme

of “turning weaknesses into strengths” guide our class discussion and springboard applications of the material to the gospel. While this was somewhat effective, students did not pick up on it as much as I thought they would. Based upon information taught in the Spring Seminar, I now recognize that I can and should be much more obvious and bold in how I deliver this information. Over the next few years, I will highlight the concept of “turning weakness into strengths” by regularly sharing applicable inspirational stories from the worlds of medicine, sports and the scriptures. As will be discussed below, I also plan to use a Flipped-class model to include more high-level learning activities that will be spiritually strengthening.

3. *Refine and Post Lectures Online to Free Up Class Time for Higher-Level Learning Activities*

- a. After considering my goals and my student reviews, I feel that freeing up class time for higher-level learning activities will help me make the class more “Intellectually Enlarging” and “Spiritually Strengthening” for the students. I will free up class time by posting some of the video lectures online, to be viewed before class. My goal is to have 2-3 high-quality video lectures and accompanying online quizzes prepared for each of my 3 units by the end of my first 3 years at BYU. I will do this gradually, first posting lectures for things that should be review from other classes.

4. *Implement Higher-Level Learning Activities In Class*

- a. To date, most of my in-class learning activities have been in the lecture format or small group discussions. While the lectures are of good quality, they do not engage or challenge the students as much as is necessary for significant intellectual or spiritual growth. As I have considered what kind of higher-level learning activities I can apply, I have had to refrain from trying to do too much at once. While my end goal is to have students perform simple research projects or labs in the class, with equipment and time limitations, I am several years away from getting to that point. Thus, at first, I will provide students with case studies where they will have to analyze the effectiveness of different interventions (*e.g.* medical treatments, supplements, product reviews). In fact, I will utilize the funds from the faculty development teaching grant to purchase material for this purpose.

5. *Reassess and Refine*

- a. As I do not expect to get the optimal results on the first attempt, I will reassess and refine my efforts during each semester. I will use mid-course reviews and student consultants to refine my efforts during the semester and end of semester reviews, and CTL consultants to refine my efforts between semesters.

6. *Increase Student Ratings for Intellectual and Spiritual Growth*

- a. By following these steps, I believe that I will develop a class that is even more intellectually enlarging and spiritually strengthening. While the primary outcome variable will be student ratings, I will also judge my efforts on written and verbal comments from students.

Research

As illustrated in Figure 2, my overall goal in terms of research in my first 3 years is to lay the foundation for a productive and renowned research program investigating the cardiovascular and metabolic consequences of physical (in)activity. Clearly, this will not take place overnight, but will require the development of several steps. Below I will address my current progress and future steps necessary to develop a productive and renowned research program.

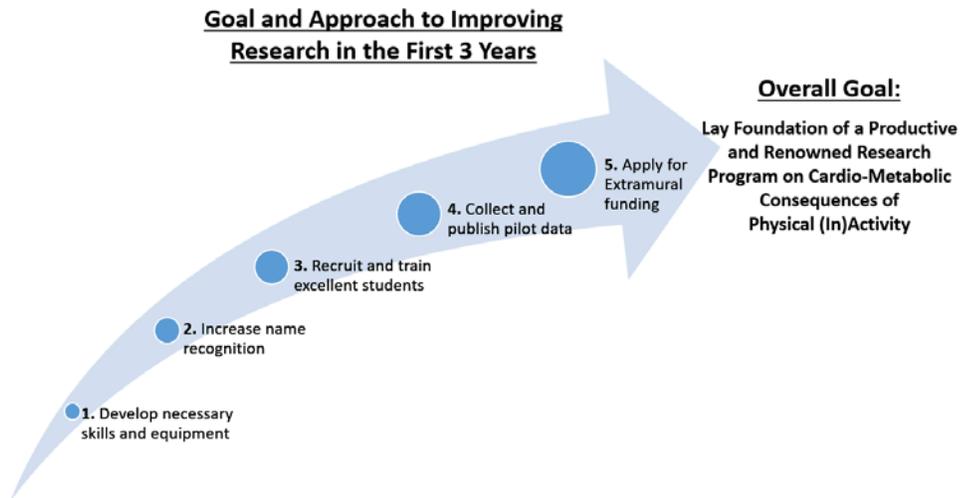


Figure 2. Goals and Approach for Improving Research in My First 3 Years at BYU.

1. Develop skills and equipment necessary to pursue influential line of research on cardio-metabolic consequences of physical (in)activity.
 - a. In order to establish a productive line of research one must have excellent skills and equipment to accomplish this. I am well underway in this regard. Before coming to BYU I developed several research skills, including vascular ultrasound, mitochondrial respiration, and exercise testing that I have been able to implement here at BYU. It should be noted that I am not merely relying on the skills I developed as a postdoc, but am also developing new skills. For example, I am currently mastering the new technique of Near-Infrared Spectroscopy. In terms of equipment, I am also on solid footing. Through generous support from my department, I have already been able to obtain much of the equipment necessary to establish my line of research.
 - b. In addition to equipment and skills having a helpful network of collaborators is also important. While at BYU I have begun to collaborate with several other faculty members in ways that has stretched and enhanced my research profile.
2. Increase name recognition
 - a. While I tend to be a reserved person who does not particularly like attention, I recognize that name recognition is necessary in order to develop a productive and renowned lab. Having published several influential papers in my field, I have a certain degree of name recognition, but not as much as is necessary. In order to increase my name recognition, over my first 3 years at BYU my goal is to
 - i. Publish as many papers as possible (~2 first/last author per year, and several co-author papers), including those from previous universities
 1. In my first year at BYU I have published 2 first author papers and have been a co-author on 3 others. I will seek to continue this trend in the future.
 - ii. Present data at national conferences, including ACSM
 1. In my first year at BYU, I have already been assigned to present in a symposium on vascular health at the ACSM national meeting. I will seek to be a regular and notable presenter at this meeting.
 - iii. Present a seminar at the regional Southwest ACSM
 - iv. Invite reputable people in my field to present seminars at BYU
3. Recruit and train excellent students
 - a. In order to have a successful research program I must have excellent students. I have used the SWACSM conference and my undergraduate class to recruit promising students. At this point my goal is to have 2 graduate students in my lab every year. Thus far, I will have one very bright student start as a master's student in Fall 2018 and another likely to start in Fall 2019. In order to train these students and my undergraduate students, I have opted to recruit them early in their academic career and provide a

comprehensive training regimen, which includes a weekly journal club to expose them to the science and regular trainings in the lab.

4. Collect and Publish Pilot Data

- a. In pursuit of my goal to develop a productive and fundable research program, I must collect and publish promising data. During my first year at BYU, through collaborations with other faculty members, I have already collected very promising pilot data regarding the impact heat therapy on the cardiovascular dysfunction subsequent to severe reduced physical activity. I hope to publish this data set, which will set me up for a subsequent grant, in the next year. Starting this fall I will have a master's student begin a project that will also serve as pilot data (effect of heat therapy on vascular and metabolic function) for this grant. In addition to publishing these data, I, and my students, will begin presenting these data at professional meetings next year.

5. Apply for Extramural Funding

- a. Having extramural funding facilitates the development of a productive and renowned research program. As a result I plan to apply for 2 external grants (1. ACSM Research Endowment to Investigate Impact of Heat on Inactivity-Induced Exercise Intolerance 2. NASA-impact of heat therapy on inactivity induced exercise intolerance, 2. ACSM-) by the end of my first 3 years at BYU. Having obtained funding before, I know how important it is to have good collaborators. For this reason, I will also make an effort to find great collaborators at BYU over the next 3 years.

By consistently working at each of these steps, I believe that I will have the foundation of a productive and renown lab specializing in the cardio-metabolic consequences of physical (in)activity by the end of my first 3 years at BYU.

Service

As a new faculty member, the expectations for my participation in formal service are reduced to facilitate growth in teaching and research. While I do not anticipate heading many committees in my first 3 years at BYU, I do plan to be involved in the growth and advancement of the department. Specifically, in order to streamline my research and service goals, during my first 3 years at BYU I will seek to facilitate the growth and advancement of the Department's research program. Below I will detail the steps I will take to do this.

1. Become familiar with the organization of the department and university

- a. In order to effectively serve I need to understand how the university works. Coming into BYU, I had very little experience with department organization and responsibilities. To become familiar with the organization of the university, I have, and will continue to, actively participate in department and college meetings. These are great venues for me to learn how the university works, what committees there are and the job of each committee.

2. Serve on Graduate Student Committees

- a. As my goal is to help strengthen the research program of the department, I am, and will continue to serve, on several graduate student committees. In this context I am able to help guide and advance department research programs

3. Recruit influential researchers to present at the department seminar

- a. In alignment with my goal of strengthening the research program of the department, I have been asked to participate in the Department Seminar Committee. My duties in this role will be to invite notable researchers, from inside and outside the university, to present their work at our monthly department seminar. I view this as a great chance to stimulate new research ideas, and collaborations, as well as showcase the talent of our department to others in order to increase name recognition.

4. Develop a weekly journal club to foster cutting-edge collaborative research in department

- a. Since arriving at BYU I have taken it upon myself to develop a weekly journal club, where students and faculty present and discuss current research. In my experience, this setting is a great way to spawn cutting-edge ideas and foster meaningful research collaborations. While the journal club has had limited attendance thus far, those who have attended have remarked how helpful it is. During my first 3 years at BYU I will put in extra effort, even if attendance is sparse, to develop this journal club into a regular, well-attended meeting.

Goal and Approach to Improving Service and Citizenship in the First 3 Years

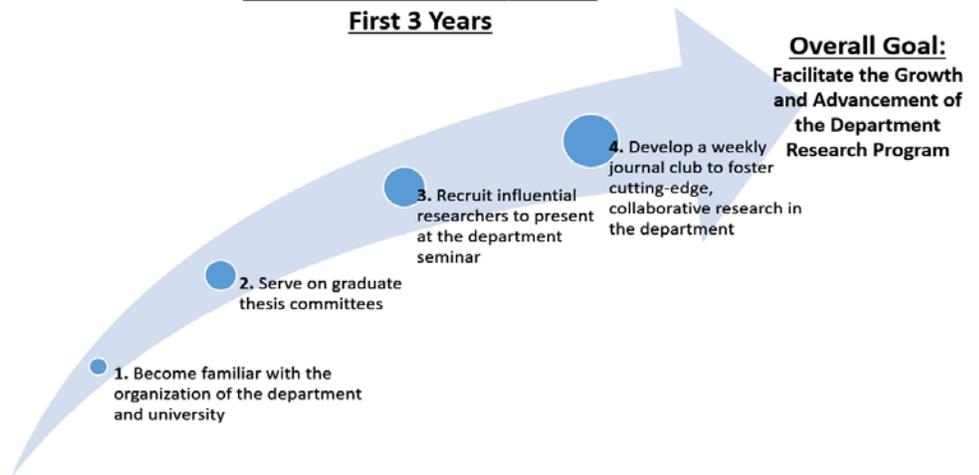


Figure 2. Goals and Approach for Improving Service in My First 3 Years at BYU.

Course Development Project

As described in my faculty development plan, and highlighted in the figure to the right, my goal for the upcoming year and the following year is to make my exercise physiology course (EXSC 463) more intellectually enlarging and spiritually strengthening.

To do this I have worked with Mike Johnson from CTL to develop a teaching centered syllabus for next semester. The two major changes that I will be implementing are

1. A partially flipped design with some lectures presented online, with accompanying quizzes
2. More applied and engaging activities during class, including testing fitness products, and taking and discussing pop quizzes.



Figure 1. Goals and Approach for Improving Teaching in My First 3 Years at BYU.

A copy of the syllabus can be found on Learning Suite with the following link :

<https://learningsuite.byu.edu/view/ozDArPVVENCT.html>

Teaching Grant Proposal
Name

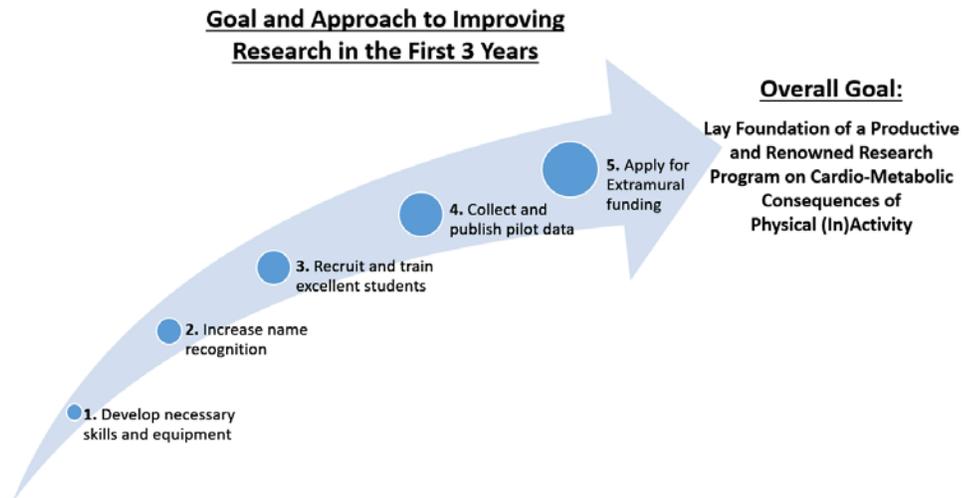
As outlined in my faculty development plan, I have the goal to make my class more intellectually enlarging and spiritually strengthening by “flipping” part of my class to make time for activities that develop higher level learning skills. I currently have the access to the equipment that is necessary to record quality lectures online. What I do not have are the materials needed to make greater use of the class time that I save by flipping my class. The purpose of this grant proposal is to seek \$300 to purchase materials that will facilitate greater student learning during class.

With access to limitless information at their fingertips, today’s college student does not need to be given information, but rather needs to learn how to scrutinize information to determine if it is trustworthy and accurate. Of all the information on the internet, claims and information surrounding exercise therapies and products for physical performance are among the most misleading. With this \$300 grant I will purchase several pieces of exercise equipment or supplements that students will have seen on TV or even at the gym. During class students will work in small groups to test the equipment to determine if the claims are accurate or not. This activity will help make the class more relevant to their daily lives (these will be products that they have heard about), and will help them to learn to apply principles we learn in the class to scrutinize the veracity of different products. A list of the potential products and their prices is provided below.

Product (including link)	Purpose	Price (\$)
<i>Unit #1 Neuromuscular</i>		
TENS Unit (Electrical Stimulation)	A TENS unit is a common piece of equipment used in physical therapy to stimulate muscle contractions. This product will help students better understand excitation-contraction coupling and the usefulness of a tool many will use as physical therapists.	30
Resistance Bands	These resistance bands will be used at multiple points in the semester to demonstrate the effects of exercise	20
<i>Unit #2: Muscle Metabolism</i>		
Creatine Supplement	This is a very common supplement that takes advantage of a major energy pathway.	15
Bench Step	This will be used for exercise demonstrations in class	40
<i>Unit #3: Cardiopulmonary</i>		
Pulse Oximeter	This will be used to measure heart rate and blood oxygen saturation during different exercises	20
Respiratory Muscle Trainer	This will be used to demonstrate the role of respiratory muscles during exercise	20
Altitude Training Mask	This commonly misused product will be used to illustrate the role of the lungs in oxygen transport and the role of different metabolic systems	40
Blood Pressure Monitor	This will be used to demonstrate the effect of different exercises and interventions on blood pressure	40
Polar Heart Rate Sensor (OH-1)	This will be used to monitor heart rate during different exercises	70
Total		~300

Scholarship Project

As is outlined in the Figure included in my faculty development program, my overall goal for my research program during my first 3 years at BYU is to lay the foundation of a productive and renowned research program on cardio-metabolic consequences of physical (in)activity. As highlighted in Figure 1, I have identified several steps to achieve this goal. Below I will describe what my efforts will be over the next 6 months in each step of this process.



1. Develop the necessary skills and equipment for my research goals

- Goal: I have already made significant progress in getting my lab up and running. I have mastered most of the equipment in my with the exception of a new piece of equipment/technique (Near Infrared Spectroscopy, NIRS) that I am current learning. My goal is to master the use of NIRS in skeletal muscle.
- Approach: Over the next 6 months, I will study 2 tutorials on NIRS, and will begin to collect NIRS data during my current studies, even though it is not a major outcome. In my opinion, there is no better way to master a technique than doing it and trying to interpret it.
- Assessment of success: By the end of 6 months I will know if I have succeeded in this regard if I am able to collect and interpret the NIRS data.

Figure 1. Goals and Approach for Improving Research in My First 3 Years at BYU.

2. Increase name recognition within the University and within the Physiology community

- Goal: Get to know at least 3 new physiologists at regional and national meetings.
- Approach: Over the next 6 months I am scheduled to present some of my data at a national meeting for exercise physiologists (ACSM). During this presentation I will present to many different scientists. My goal is to take the time to get to know 2-3 of them fairly well, so that I know their name and research and they know mine. I will also attend a regional meeting for exercise physiologists (SWACSM) in October. This meeting is much smaller and intimate. My goal for this meeting is to get to know, and become known, by an additional 2-3 exercise physiologists within the region.
- Assessment of Success: By the end of 6 months, I will know if I have succeeded in this regard if I have a professional relationship with 3 scientists that I do not currently know.

3. Recruit and train excellent graduate students

- Goal: Recruit 2 masters students for Fall 2019.
- Approach: During my classes and at national/regional meetings I will interact with promising students and try to sell them on the research that we do in my lab. In addition to recruiting directly from my classes, I will also send out an email and accompanying application (Qualtrics Survey) to all students in the department encouraging qualified and interested students to complete their graduate studies with me. This will allow me to recruit for a bigger pool, and hopefully identify especially promising students.
- Assessment of Success: Applications for graduate school are due in February 2019. I will know if I have succeeded in recruiting excellent students by how many people apply to work with me.

4. Collect and publish pilot data

- Goal #1:
 - i. Finish collecting data and write up first draft of my first immobility study that investigates the impact of heat on disuse-induced vascular dysfunction.
 - ii. Approach:

1. As data collection is nearly finished, I will focus upon writing this manuscript. My plan for the rest of the summer and fall is to dedicate my first 1.5 hours work each day to writing this and supporting manuscripts.
 - iii. Assessment of Success: I will know if I have succeeded in this regard if a complete manuscript has been written in the next 6 months.
 - Goal #2: With graduate students refine research questions, methods and assign roles for the studies that will support my next grant application, "The Effect of heat therapy on inactivity-induced exercise intolerance"
 - i. Approach
 - ii. Study 1: Effect of heat therapy on vascular function in young sedentary and older individuals.
 1. Assign to graduate student #1 to refine methods and research questions.
 - iii. Study #2: Effect of heat therapy on muscle blood flow and exercise intolerance in young sedentary and older individuals?
 1. Assign to graduate student #2 to refine methods and research questions.
 - iv. Assessment of Success: I will know I have succeeded if my students can clearly summarize the research questions and methods that they will use for our next projects.
5. Apply for Extramural Funding
- Goal: Apply for at least one extramural grant in the next 6 months
 - Approach: I have identified two grants that I am on track to apply for in the next 6 months (NASA, and ACSM). I have collected pilot data that will help make a compelling argument in these grants. In the next 6 months I will finish assembling my team of research partners and submit at least one of these applications.
 - Assessment of Success: I will know I have succeeded in this regard if I have applied for at least one of these grants.

Citizenship Project

As is outlined in the Figure included in my faculty development program, my goal for citizenship is to facilitate the growth and advancement of the department research program. My project for citizenship over the next 6 months will be the development of a weekly journal club to foster cutting-edge, collaborative research in the department. In order to help other faculty, who have not previously participated in a journal club, to see the utility in the club, and to commit to attending regularly I will take the following steps between now and Winter 2019.



Figure 1. Goals and Approach for Improving Service in My First 3 Years at BYU.

Spring/Summer 2018

1. Ask faculty with related interests to recommend that the students in their labs attend and present in the weekly club over the summer.
2. Hold a weekly journal club
 - a. Due to the small initial attendance, I must be willing to present several times during the spring and summer.
 - b. I also must be willing to take time from my schedule to help students prepare for the times when they present.

Fall 2018

3. Ask 2-3 faculty members, who have related research programs, to present an article in the journal club in the fall semester.
 - a. This will help the faculty members have some investment in the program and will hopefully help them see how it can benefit their research program and their student mentoring.
4. Continue to hold the weekly journal club.
 - a. I must be willing to take time from my schedule to help students prepare for the times when they present.