



Building skills of minority doctoral students to apply health behavior theories: a case study

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Corresponding Author:

Dr. Vinayak K Nahar,
Assistant Professor, Center for Animal and Human Health in Appalachia, College of Veterinary Medicine, DeBusk College of Osteopathic Medicine, and School of Mathematics and Sciences, Lincoln Memorial University - United States of America

Submitting Author:

Dr. Vinayak K Nahar,
Assistant Professor, Center for Animal & Human Health in Appalachia College of Veterinary Medicine, Debusk College of Osteopathic Medicine, and School of Mathematics and Sciences, Lincoln Memorial University, Harrogate, TN, 37752 - United States of America

Other Authors:

Dr. Manoj Sharma,
Professor, Behavioral & Environmental Health, School of Public Health, Jackson State University, Jackson, MS, 39213 - United States of America

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Building skills of minority doctoral students to apply health behavior theories: a case study

Author(s): Sharma M, Nahar VK

Abstract

At present, in the United States, there is a dearth of well-trained minority leaders in the field of health behavior research who can develop and test theory-driven behavioral interventions, especially for minority communities. The purpose of this case study was to document the design, development, implementation, and evaluation of a doctoral-level course to equip minority public health doctoral students to initiate engagement in such research. The case study summarizes the theoretical underpinnings of this course, the course objectives, texts used in the course, graded course assignments, skill building activities, linkages between public health competencies and learning objectives and the grading in the course. The evaluation of this course using the strengths, weaknesses, opportunities, and threats (SWOT) framework by the students is also presented. This case study can serve as a starting point for initiating a dialogue on improving preparation of minority scholars in health behavior research.

Introduction

Institute of Medicine (IOM, 1988) in its classic treatise, *The Future of Public Health*, recommended improved training in quantitative methods and research skills for public health students. Three decades have elapsed since the publication of this report. Still there are significant gaps in this context, especially when it comes to training minority students, more so in behavioral public health sciences. Such trained scholar leaders in the field of health behavior research constitute only a handful of professionals and are truly a minority among minorities. Much lip service is accorded in this regard by the policy makers but very little concerted and dedicated effort is seen in reality. There have been attempts by some educational interventions to increase the underrepresented minority graduate students in behavioral sciences that are strongly trained in application of theory and research so that they can assume leadership roles. One such program is the Training and Education to Advance Minority Scholars in Science (TEAM-Science), an endeavor at the University of

Wisconsin-Madison funded by the National Institute of General Medical Sciences (Byars-Winston, Gutierrez, Topp, & Carnes, 2011). The programs underpinnings are based on social cognitive theory (Bandura, 1986; 2004) as per its application to career development. The program utilizes mentor training, consensus-based basic required competencies, career coaching, a tailored career growth plan that links student activities with the requisite competencies, and a personalized career analysis. The program has had some short-term success in this regard but such programs are by far very few. There is still lot of unmet need to train minority behavioral health track public health doctoral students in the state-of-the-art theoretical models and paradigms so that they can easily reify these to undertake independent dissertation research. Furthermore, this enhancement of the minority doctoral scholars capabilities need to be augmented so that these students can pursue life-long research agenda in ameliorating the discipline and making a difference in the lives of the minority communities that they will presumably serve. Only then can these minority scholars assume leadership positions in our discipline and partake in key policy decisions.

The doctoral program at the School of Public Health at Jackson State University, a Historically Black University in the Deep South, offers one such Doctor of Public Health (DrPH) program in the concentration of Behavioral Health Promotion and Education. The program aims to enhance the capabilities of minority doctoral students in behavioral science research and encourages them to undertake research guided by behavioral theories relevant to minority populations. Case studies of two graduate courses offered by this program have been documented in the literature (Sharma & Nahar, 2017a; Sharma & Nahar 2017b). The program is in its infancy stages and is slowly evolving and developing. It is in this context that this case study discusses one such course offering by this program.

Purpose

The purpose of this article is to summarize the design, development, implementation, and evaluation of one doctoral level course in behavioral public health sciences for minority students. The course aims to equip minority students in comprehending behavioral

theories and models so that they can undertake doctoral dissertation research guided by such theories. The course is called PHBS 711: Advanced theories and scientific principles for health promotion and education.

Theoretical underpinnings

Hovell, Adams, and Semb (2008) in teaching research methods to graduate public health students have used the application of Keller's (1968) Personalized System of Instruction (PSI) that emphasizes individualized instruction and use of lectures to motivate students instead of merely imparting information. The approach also uses Socratic-type programming (Binker, 1993) that requires students to respond during lectures instead of being passive absorbers of information. They have had some successes with these two approaches. The course which this study documents also utilizes such approaches and, in addition, is based on the tenets of social cognitive theory (Bandura, 1986; 2004) in its approach. The constructs of social cognitive theory that this course utilizes are as follows.

First, the expectations construct about successfully undertaking dissertation research based on behavioral theories is explored and gradually reinforced throughout the course. Expectations are based on outcome expectations (which are the anticipatory outcomes of a behavior) and outcome expectancies (which constitute the importance that a person places on these outcomes). The minority scholars in the course are constantly encouraged to think about what outcomes they want to achieve through this course particularly as it relates to their doctoral dissertations and careers. They are asked to conceptualize a tentative behavior change topic that may be viable for their dissertations and tailor all their assignments to it.

Second, the self-efficacy for operationalizing behavior theories in research of the students is built by mastery of doable stepwise assignments. The assignments begin in small steps where initial three assignments are used to identify some existing applications of theories in the literature pertaining to their chosen behavior, critiquing them in terms of their strengths and weaknesses and then formulating a brief plan to overcome the weaknesses and presenting an improved version. The fourth assignment pertains to developing a tentative instrument that applies one of the chosen theories to the chosen behavior. The students enrolled in the class and the instructor critique that instrument. The final assignment pertains to developing a tentative, brief, three session intervention based on the chosen behavior and theory. The construct of self-efficacy is also built by linking

identified public health competencies with the assignments. After each module there are specific skill building activities for the students to complete. These are not graded but are encouraged for the students to complete. These become mandatory for classes that are held online. Furthermore, self-efficacy is built through presentation of written assignments by the students and facilitating a question-answer session and their critique by fellow peers and the instructor.

The constructs of knowledge and vicarious learning are reinforced throughout the course by the instructor through interactive lectures and sharing of his own experiences and those of others in reifying the discussed theories. The instructor has worked hands on with the health belief model (e.g. Asare, Sharma, Bernard, Rojas-Guyler, & Wang, 2013), transtheoretical model (e.g. Fahrenwald & Sharma, 2002), social cognitive theory (e.g. Miller, Sharma, Brown, & Shahbazi, 2015), theory of planned behavior (e.g. Branscum & Sharma, 2014), emotional intelligence theory (e.g. Branscum, Haider, Brown, & Sharma, 2016), Freirian model of adult education (e.g. Sharma & Deepak, 2001), theories of stress and coping (e.g. Knowlden, Hackman & Sharma, 2016) and multi-theory model (MTM) of health behavior change (e.g. Sharma, 2015; 2017; Sharma et al., 2017). The instructor is not only able to share the methodological strengths and weaknesses of the application of these theories in his research but also provide contextual and anecdotal details while discussing these experiences that enhance vicarious learning.

The construct of emotional coping is transcribed in the course by allowing the students to resubmit their assignments, if deficiencies are found. Furthermore, the pressure of testing and examinations for grading are removed. The students are periodically given quizzes and tests but those are not graded and these only help in mastery of knowledge through self-evaluation and identifying what the scholars missed and where they could improve.

The construct of self-control is facilitated among the scholars through helping them to set goals for themselves to improve their non-graded quiz scores, completion of assignments in a timely manner and meeting the course deadlines. Finally, the construct of environment is facilitated through the creation of a supportive, non-threatening, analytical milieu for conducting the classes.

Course layout

The course is a hybrid course which means that at least half of the course is taught face-to-face and part

is conducted through synchronous or asynchronous online delivery. In this section, we will discuss the course objectives, texts used in the course, graded course assignments, skill building activities, linkage between public health competencies and learning objectives and the grading in the course.

Learning objectives

The objectives of the course are that after its completion it is expected that the students will be able to:

- (1) Apply and critique commonly used theories in health education/promotion work at the individual level such as health belief model (HBM), theory of reasoned action (TRA), theory of planned behavior (TPB), integrative model, emotional intelligence (EI) theory, information motivation and behavioral skills (IMB) model, self-determination theory (SDT), and trans-theoretical model (TTM).
- (2) Apply and critique commonly used theories in health education/promotion work at the interpersonal level such as social cognitive theory, stress and coping theories, theory of gender and power, multi-theory model (MTM) of health behavior change and social support theory.
- (3) Apply and critique commonly used theories in health education/promotion work at the community level such as diffusion of innovations, community coalition action theory, PRECEDE-PROCEED model, social marketing and Freirian praxis.
- (4) Apply the theoretical concepts to developing instruments for predicting and explaining health behaviors.
- (5) Use sound behavioral techniques to plan, implement, and evaluate health education program(s) at individual, group, and community levels.

Texts used in the course

Sharma, M. (2017). *Theoretical foundations of health education and health promotion*. (3rd ed.). Burlington, MA: Jones and Bartlett. (ISBN # 978-1-2841-0494-3)

Sharma, M., & Petosa, R. L. (2014). *Measurement and evaluation for health educators*. Burlington, MA: Jones and Bartlett. (ISBN# 978- 1-4496-2820-8).

Graded course assignments

There are five assignments to be completed for the course that are graded. For each assignment the student is required to make a class presentation consisting of Power Point slides (min. 10 slides). The class presentation is supposed to be for approximately 10-15 minutes. If the class is held online the day the student is supposed to present the assignment then

the student is required to upload the presentation slides in the Discussion Forum of the Canvas platform of the course and other students are required to ask question in the Discussion Forum. If the student does not make the class presentation 20% points are deducted from the grade for that assignment. All papers are required to adhere to the *American Psychological Association (APA) 6th edition* guidelines.

Assignment #1. Application & critique of an individual level theory. (Worth 20% or 200 points). For this assignment the student is required to select any one individual level theory such as health belief model (HBM), theory of reasoned action (TRA), theory of planned behavior (TPB), integrative model, emotional intelligence (EI) theory, information motivation and behavioral skills (IMB) model, self-determination theory (SDT), or trans-theoretical model (TTM). The student is required to apply that theory to a health behavior relating it to a previous published application and discuss the strengths and weaknesses of that theory (critique). The student must synthesize the findings in a paper. The paper is approximately 500-600 words in length (excluding tables, figures, and references). The assignment is graded in the following way: (1) Application of the constructs: 50 points; (2) Strengths of the theory: 50 points; (3) Weaknesses of the theory: 50 points; and (4) APA style: 50 points.

Assignment #2. Application & critique of an interpersonal level theory. (Worth 20% or 200 points). For this assignment the student is required to select any one interpersonal level theory such as such as social cognitive theory, stress and coping theories, theory of gender and power, multi-theory model (MTM) of health behavior change and social support theory. The student must then apply that theory to a health behavior relating it to a previous published application and discuss the strengths and weaknesses of that theory (critique). The student must synthesize the findings in a paper. The paper is approximately 500-600 words in length (excluding tables, figures, and references). The assignment is graded in the following way: (1) Application of the constructs: 50 points; (2) Strengths of the theory: 50 points; (3) Weaknesses of the theory: 50 points; and (4) APA style: 50 points.

Assignment #3. Application & critique of a community level theory. (Worth 20% or 200 points). For this assignment the student must select any one community level theory such as diffusion of innovations, community coalition action theory, PRECEDE-PROCEED model, social marketing and Freirian praxis. The student is required to apply that theory to a health behavior relating it to a previous published application and discuss the strengths and

weaknesses of that theory (critique). The student is required to synthesize the findings in a paper. The paper is approximately 500-600 words in length (excluding tables, figures, and references). The assignment is graded in the following way: (1) Application of the constructs: 50 points; (2) Strengths of the theory: 50 points; (3) Weaknesses of the theory: 50 points; and (4) APA style: 50 points.

Following tips are provided for attempting Assignments #1-3:

-- Summary of the chosen article in your own words underscoring purpose, methods, key results and conclusion in 100-150 words (Please do not copy the abstract).

-- Bullet points or a Table of strengths of the article or a write-up in 75-100 words.

-- Bullet points or a Table of weaknesses of the article or a write-up in 75-100 words.

-- Your approach of applying the theory (with fewer weaknesses) to the same or another behavior in your own words (150-200 words).

-- A diagram summarizing your approach as a Figure.

-- Final conclusion in 1-2 sentences.

-- References in APA style.

Assignment #4. Development and mock testing of an instrument based on a behavioral theory. (Worth 20% or 200 points). For this assignment the student is required to select a behavioral theory, a target population and a health behavior. Then the student must develop constitutive and operational definitions of all or at least five constructs of the theory; generate items for the constructs; choose scales and develop an instrument. The student is then required to ask the students of the class (at least four) or other doctoral students to serve as panelists to establish face and content validity of the instrument in two rounds. Then the student is required to finalize the instrument based on this process. The student must submit the definitions, the letters to the panel, the original instrument and the final instrument for grading. Word limit does not apply to this assignment. The assignment is graded in the following way: (1) Definitions: 50 points; (2) Letters: 50 points; (3) Quality of the final instrument: 100 points.

Assignment #5. Development of a behavioral intervention based on a behavioral theory. (Worth 20% or 200 points). For this assignment the student is required to select any target population. The student must design at least three sessions of a culturally appropriate behavioral intervention using any theory discussed in the class. The intervention must include

behavioral objectives, diagrammatic depiction of how theory has been used, lesson plans for each of the three sessions with learning objectives, content, learning process, and time. There is no word limit for this paper. The assignment is graded in the following way: (1) Behavioral objectives: 50 points; (2) Diagrammatic depiction of the model: 50 points; (3) Lesson plans for 3 sessions: 100 points.

Following possible template for preparing the lesson plans for this assignment is provided to the students:

Behavioral objective: [Write for each construct and behavior using SMART approach] [For each behavioral objective summarize the lesson plan in the following format]

Learning Objectives

- [Use SMART approach]

Content

- [Delineate educational content for instructor/facilitator & learners]

Learning Process

- [Elaborate cognitive (e.g. lecture, case study etc.), affective (e.g. role play, psychodrama, simulation etc.) or environmental (e.g. membership to gym, networking, lobbying etc.) methods used]

Time

- [Provide duration for the activity]

Skill Building Activities

The course is organized into sixteen modules. Each module has a skill building activity to be completed upon its completion. As explained earlier, these are not graded but their completion is encouraged and these become mandatory to complete for classes that are held online. The skill building activities are as follows:

Module 1: Introduction

- Through self-reflection, identify three positive health behaviors that you may be able or willing to work on during this term.
- Through self-reflection, identify three negative health behaviors that you may be able or willing to work on during this term.
- From the six behaviors, choose the one behavior you like most.
- Define the chosen behavior. Then identify an appropriate target group and setting for a health education or promotion program.
- Using the SMART way of writing objectives, write at least three program objectives that would help bring

about positive change in this behavior in your target population. The SMART acronym is: S = Specific (what exactly is being changed and in whom); M = Measurable (percentage of participants who will change); A = Action verb (list, describe, identify, explain); R = Realistic (must be achievable); T = Time frame (end of the session, end of one year)

Module 2: Planning models

- Choose any one behavior.
- Choose any one target population where this behavior will be most suitable.
- Draw a diagram explicating the links between various components of the PRECEDE-PROCEED model and the chosen health behavior.
- Present your final work in a word-processed diagram.

Module 3: Health belief model

- Identify at least two strengths of the example of application of HBM to stress management.
- Identify at least two weaknesses of the example of application of HBM to stress management.
- Discuss the strengths and weaknesses and ways of application of HBM to specific chosen health behaviors.

Module 3A: Basics of measurement

- Imagine you have been hired to evaluate a safer sex intervention among college students that is based on social cognitive theory.
- Identify the variables that you would study for process and impact evaluation of this intervention.
- Also if this intervention was part of several other interventions in the area, what variables would you choose for outcome evaluation?
- After identifying the variables, choose what scale of measurement you would apply for each one of those variables.

Module 4: Transtheoretical model

- Specific to your behavior, reflect on how you might assess the stage from transtheoretical model in which individuals in your target group might fall.
- Identify learning activities (processes) for those at each stage of change.
- How might you improve the population impact for your target group?

Module 4A: Steps in instrument development

- Let us consider social cognitive theory. Let us take the constructs of expectations, expectancies, and self-efficacy.
- Let us consider the behavior of physical activity in college students.
- You are to develop an instrument for these three constructs for physical activity behavior in college students.
- Operationally define each of the three constructs and generate potential items. Then choose a rating scale

and prepare a draft instrument.

Module 5: Theory of reasoned action and theory of planned behavior

- Choose a health behavior.
- Diagrammatically draw how you would apply Theory of Reasoned Action (TRA) to modify that behavior.
- Neatly word process your diagram using software of your choice.

Module 5A: Reliability assessment

- Take an existing instrument which you have created in the previous chapter or that is presented in this book or that you have access to.
- Enter the instrument in SPSS and create a mock data set for 30 respondents.
- Also add a retest data for these 30 subjects.
- Calculate the Cronbach's alpha, test-retest reliability coefficient, and split-half coefficient on this data set.
- Interpret the results.

Module 6: Newer theories

- Choose a health behavior change of your choice
- Choose a target population of your choice
- Develop a health behavior change intervention for initiation and sustenance of health behavior change using the constructs of MTM and specifying the behavioral and learning objectives, educational processes, activities, and duration.

Module 6A: Validity assessment

- Choose a behavior commonly used in health education such as physical activity behavior or safer sex behavior or any other behavior of your choice.
- Conduct a database search of MEDLINE (PubMed), CINAHL, and ERIC using the keywords related to that behavior and adding confirmatory factor analysis or construct validity.
- Locate an article that has performed confirmatory factor analysis for construct validation Answer the following questions:
 - What is the sample size? Is it adequate for factor analysis?
 - Does the article describe whether the assumptions for factor analysis have been met?
 - What method of factor extraction has been used?
 - What are the criteria for factors to be retained?
 - Has rotation been done?
 - What factor loading has been used for interpretation of factors? Is it adequate?
 - What are the criteria for judging goodness of fit? Are these adequate?

Module 6B: Measurement errors

- You have to observe physical activity behavior of upper elementary school students while they are in physical education class.

- Develop an observation protocol to observe this behavior.
- Also develop a training protocol for training observers to record this behavior.
- Make a list of all potential errors in both protocols. How would you reduce those?

Module 7: Theories of stress and coping

- Identify any three constructs from the classical transactional model of stress coping.
- Develop specific behavioral objectives corresponding to these constructs.
- Describe specific activities you will use to modify these constructs in order to accomplish the objectives.
- How can you enhance the predictability of the classical model?

Module 8: Social cognitive theory

- Choose any one behavior for application to a definitive target group in health and human services. Define the behavior (frequency, intensity, and duration) and target group.
- Identify any four constructs from social cognitive theory. Discuss how you will modify these constructs to shape behavior through an educational program for the target group.
- Draw a diagram explicating the links between the educational processes and the behavioral constructs to affect the behavioral outcome.

Module 9: Social marketing

- Consider the problem of binge drinking on college campuses.
- How would you go about designing a social marketing campaign to reduce binge drinking?
- Discuss aspects of audience segmentation and marketing mix.

Module 10: Diffusion of Innovations

- Choose a novel health education behavior.
- Identify the attributes of the innovation.
- Identify the communication channels.
- Identify the attributes of time.
- Identify the attributes of the social system.

Module 11: Freires model of adult education

- Choose a health behavior for modification in a target population.
- What would be the best educational method to facilitate dialogue?
- What would be the best educational method to facilitate conscientization?
- What would be the best educational method to facilitate praxis?
- What would be the best educational method to facilitate transformation?
- What would be the best educational method to

facilitate critical consciousness?

Public Health Competencies and Learning Objectives

1.

Objective

- Apply and critique commonly used theories in health education/promotion work at the individual level such as health belief model (HBM), theory of reasoned action (TRA), theory of planned behavior (TPB), integrative model, emotional intelligence (EI) theory, information motivation and behavioral skills (IMB) model, self-determination theory (SDT), and trans-theoretical model (TTM).

Competency

- Applies advanced theories, concepts and models from a range of social and behavioral disciplines that are used in public health research and practice

Assessments/Outcomes

- Skill building activity at the end of the modules.
- Assignment #1. Application & critique of an individual level theory.

2.

Objective

- Apply and critique commonly used theories in health education/promotion work at the interpersonal level such as social cognitive theory, stress and coping theories, theory of gender and power, multi-theory model (MTM) of health behavior change and social support theory.

Competency

- Applies advanced theories, concepts and models from a range of social and behavioral disciplines that are used in public health research and practice.

Assessments/Outcomes

- Skill building activity at the end of the modules.
- Assignment #2. Application & critique of an interpersonal level theory.

3.

Objective

- Apply and critique commonly used theories in health education/promotion work at the community level such as diffusion of innovations, community coalition action theory, PRECEDE-PROCEED model, social marketing and Freirian praxis.

Competency

- Applies advanced theories, concepts and models

from a range of social and behavioral disciplines that are used in public health research and practice.

Assessments/Outcomes

- Skill building activity at the end of the modules
- Assignment #2. Application & critique of a community level theory.

4.

Objective

- Apply the theoretical concepts to developing instruments for predicting and explaining health behaviors.

Competency

- Applies advanced theories, concepts and models from a range of social and behavioral disciplines that are used in public health research and practice.

Assessments/Outcomes

- Skill building activity at the end of the modules
- Assignment #4. Development and mock testing of an instrument based on a behavioral theory.

5.

Objective

- Use sound behavioral techniques to plan, implement, and evaluate health education program(s) at individual, group, and community levels.

Competency

- Applies advanced theories, concepts and models from a range of social and behavioral disciplines that are used in public health research and practice.

Assessments/Outcomes

- Skill building activity at the end of the modules
- Assignment #5. Development of a behavioral intervention based on a behavioral theory.

Grading in the course

The grading at the doctoral level is based on completion of quality assignments. There are no exams.

Assignment #1: 200 points (Individual level behavioral theory paper)

Assignment #2: 200 points (Interpersonal level behavioral theory paper)

Assignment #3: 200 points (Community level behavioral theory paper)

Assignment #4: 200 points (Instrument paper)

Assignment #5: 200 points (Intervention paper)

The following grading scale is used: A is given for a score of 900-1000 points; B grade is given for a score of 800-899 points; C grade is given for a score of 700-799 points; D grade is given for a score of 600-699 points and scores below 599 earn a F grade.

Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of the course by the students

Strengths (S), weaknesses (W), opportunities (O), and threats (T) (SWOT) analysis is a common strategic planning technique used in management (Ghazinoory, Abdi, & Azadegan-Mehr, 2011) and has also been applied in public health (von Kodolitsch et al., 2015). Strengths and weaknesses are usually considered as internal and present processes while opportunities and threats usually pertain to external environment and are futuristic (Wehrich, 1990). This method was applied to gauge qualitative insights from the viewpoint of the students as a means to continually improve the quality of this course. Provided below is a verbatim summary of the qualitative SWOT analysis done by the students enrolled in the Fall 2017 offering of this course one week before the conclusion of the course. The instructor excused himself from the class while this activity was self-conducted by the students without any identifiers attached to the responses.

Strengths

- Very informative.
- Professor was patient and available for help.
- Professor did a great job in explaining the content.
- Very understanding of the student workloads.
- The books were very helpful with this course.
- The instructor allowed students to correct errors in assignments which enhanced learning
- Assignments were challenging.
- I learned the application of knowledge related to theories for use in my dissertation.
- I believe this class is very important even for students from other concentrations.
- Professor is a wonderful person! I was a little skeptical about his new teaching method (pre-recorded lectures) but now I really enjoy them.
- A very wonderful professor. Very knowledgeable, articulate and helpful to the students.
- He was always well prepared for class and came before time.
- Very understanding of students emotions and concerned with their performance.
- I really enjoyed this class. I would gladly say this was my best class this semester. Professor communicated with students efficiently. The activities for each class were well organized and carefully thought out.

Weaknesses

- For visual learners providing models would be very helpful.
- Trying new technology-did not always go well in the beginning but improved with the semester's progression. Actually enjoyed toward the end.
- Recorded class lectures were a barrier.
- Lectures were lengthy (informative in the beginning but long).
- Sometimes when you are in other concentration such as epidemiology you must do lot of hard work before class.
- I did not understand some of the assignments so I think that a discussion of the assignments should take place weeks in advance not just before they are due to make sure everyone understands them.
- The course can review in the very first class all the theories in order to improve the learning process.
- The two books were expensive.
- Have guest lectures.

Opportunities

- More interactive learning.
- More student focused activities/projects.
- The course can be completely online in the future for all students.

Threats

- Access to the Internet.
- Balancing job and family.
- Have a student copy of the books in the library as costs could be an issue for some.
- Technology is very important issue especially for synchronous online classes as you cannot participate if you do not have a microphone.
- Technical difficulties especially in the synchronous online classes can interrupt the learning process.
- Cost of the books.

Conclusions

This course has regularly been taught since 2015 and has been taught only three times thus far. As a result of participating in this course several students have undertaken or are undertaking theory-based dissertation research and other projects. These are at varying levels of completion. Some of the students have been able to present their work at national conferences such as the American Public Health Association Annual Meeting. The course continues to improve in its delivery and content. It is envisaged that reading this case study other instructors would be motivated to design, implement, evaluate, reflect and continually improve their courses for enhancing minority doctoral level preparation courses and thereby improving leadership of minorities in higher education and public health.

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