Two Approaches for Using Web Sharing and Photography Assignments to Increase Critical Thinking in the Health Sciences

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Increasing student critical thinking and active engagement with course content is an ongoing challenge in tertiary education. The present article explores the use of photography in two health sciences courses as a catalyst for the encouragement of critical thinking, creativity, engagement, and problem solving. The authors adapted photography assignments based on Photovoice and photo elicitation which are described in detail along with the benefits and challenges of utilizing nontraditional assignment formats. The immediate impact of these assignments appears to have challenged students' thinking about the health culture in their lived environments and has allowed them to critically investigate and interpret their photos and the photos of their classmates.

Problem Statement

As faculty we seek to not only prepare our students for their future careers, but also to instill the ability to think critically and consciously about the impact their decisions will have on their health and quality of life. In an effort to find classroom approaches and methodological designs that push students to move away from ingrained passive expectations of education towards an active engagement with content outside the classroom, the authors developed two photography assignments with the hope of encouraging critical thinking and student engagement. With our combined teaching experience of 38 years, it had been an ongoing frustration to face the cognitive disengagement of undergraduate students: less critical thought and more expectation for simple memorization of content. The elimination of creativity and meaningful thought processes like critical thinking and problem solving not only make health science undergraduates continually less prepared for graduate programs but also for their future professions. The present article explores the use of photography in two health sciences courses as a catalyst for the encouragement of critical thinking, creativity, engagement and problem solving.

Though the authors' collective teaching experience ranges over multiple universities and across several states, the commonality of the problem at hand is of concern. While it is clear our current students at a state selective liberal arts university have benefited from better educational systems in general than some students in our previous situations, this benefit does not appear to have differentiated them in terms of intellectual curiosity, critical thinking, or willingness to engage course topics intellectually. Perhaps our frustration is compounded by the understanding that these students, the majority of whom come from families with parents in the professional class, have been given so much benefit early on, and yet their educational expectations flounder somewhere beyond "doing enough to get by" while expecting exceptional grades, admittance to a graduate school of their choosing, and ultimately a well-paying professional job in the fields of allied health. While the fields within allied health continue to grow at an exponential pace in terms of job opportunities (Bureau of Labor and Statistics, 2010), the United States is also faced with difficult decisions regarding the implementation and management of its healthcare system as well as effective patient care. Such concerns require our students to knowledgably engage their chosen field through thinking critically and creatively. Additionally, without creating opportunities for our students to engage course topics and critically address them, they leave our educational programs unprepared for graduate work but also unprepared to be citizen health advocates.

Critical thinking is the capacity to scrutinize information by asking important questions, articulating the questions clearly, collecting and evaluating pertinent information, applying theoretical concepts, being open-minded, and communicating well with others (Duron, Limbach, & Waugh, 2006). Being able to think critically is vital and essential in the workplace and in real world situations where it can assist in the evaluation of persons, situations, policies, and institutions, thus limiting social problems (Duron, Limbach, & Waugh, 2006). Additionally, faculty advocate that critical thinking creates a more engaged student body (indeed, a more engaged citizenry) that is essential to the production of informed and knowledgeable, perhaps even autonomous and socially-inclined people. Despite this need for encouraging critical and creative thinking among our student population, a recent survey notes that by the end of their sophomore year of college 45% of the students surveyed demonstrated little advancement in complex reasoning and writing and critical thinking skills (Bok, 2006). In order to intervene in such circumstance, we need to change the way we as educators approach teaching students and how the students themselves

expect to learn. Vrasidas and Glass (2004) assert the following:

> Students learn best when they are actively engaged in meaningful activities; when they collaborate with peers, exchange ideas, and provide and receive peer feedback; when they reflect critically on what they are doing; when they work on real-world, challenging, authentic activities; when their work is constantly evaluated; and when they are intrinsically motivated. (p. 2)

The assignments discussed in the following paper address these two problems (i.e., student engagement and critical thinking) simultaneously while introducing pedagogical strategies for change in the classroom.

Photography and Image Work in the Tertiary Classroom

In this day and age of technology researchers have available to them new and exciting data collection methods. The use of digital photography, photo sharing applications, and photo editing programs offer an engaging and applicable experience for students. *Photovoice* and *photo elicitation* are research methods that use photos as a means of prompting discussions of perspectives, experiences and beliefs about not only health content but more generally about the world in which we live (Oware, Diefes-Dux, & Adams, 2007). Further delineation and discussion of these two approaches can be found in the methods section.

Based on constructivism learning theory (Bruner, 1985), Photovoice and photo elicitation allow students to learn through experience. The photographs give students the opportunity to interpret experiences, analyze relationships, evaluate differing interpretations, make inferences to draw conclusions, and explain results. The aforementioned concepts, with the addition of learning to reflect and self-regulate, comprise the main constructs of critical thinking according to Facione (2011).

There are several approaches in using visual media as a classroom methodology such as autophotography, photo journaling, e-portfolios, photoessays, photointerviewing, and other forms of photography. Brown (2005) used photography assignments and discussions to increase critical thinking and overcome subconscious resistance in training future teachers to work in multicultural school environments. The use of photography, self-reflection, and facilitated discussions was used to increase the types of understandings that can be difficult to provide outside of practicum, placed, or other real world experiences (Brown, 2005). Photography and photography assignments have also been used in the classroom to improve students' visual literacy and critical thinking skills. (Anderson, 2005; Ferrarotti, 1993; Messaris, 1998; Romice, 2000; Woodland & Szul, 1999). Further, photographs have been used to elicit social action from students and community members (Carlson, Engebretson, & Chamberlain, 2006; Catalani & Minkler, 2010). Because of its ability to enhance the learning experience, photography has been used most commonly in media and communication disciplines as well as visual anthropology and sociology (Chaplin, 1994; Curry & Clarke, 1977). To date, there are a limited number of studies exploring the use of photography in undergraduate health courses.

Zecevic, Magalhaes, Madady, Halligan, and Reeves (2010) used senior undergraduate health science students enrolled in a Health Issues in Aging course to examine their knowledge, experiences, and feelings on aging through Photovoice. Based on their findings, Photovoice proved to be a valuable teaching tool, allowing students to feel empowered through participation by giving them an opportunity to explore their concerns about aging in a visual way. In 2009, Brand and McMurray examined the perceptions towards aged persons in nursing homes among seven nursing students. According to the authors, critical reflection and expressive dialogue were provoked through photo-elicitation techniques (Brand & McMurray, 2009). Likewise, Killion (2001) experimented with teaching culturally sensitive nursing to undergraduates through using photographs taken by the students and that represented cultural aspects of health. This study found that the photographs provided insight into the students' own biases and stereotypes of culturally diverse populations, thus allowing the students to engage in deep self-reflection and become more culturally sensitive (Killion, 2001). Goodhart et al. (2006) enlisted the help of 75 undergraduate students enrolled in four different health courses to examine healthy eating, drug use, social injustice, and emotional support available on campus. Based on the researchers' findings, Photovoice raised students' awareness of their surroundings and gave them a voice to influence university policy makers. Finally, Garcia, Sykes, Matthews, Martin, and Leipert (2010) used undergraduates enrolled in an introductory nutrition class to investigate the perceived barriers and enablers of healthy eating. The authors reported that Photovoice allowed the students to look at things from a different perspective and think outside the box. The present classroom methodologies were adopted from previous scholarship on the use of photos to increase critical thinking and student engagement in the university classroom.

Methods

In search of creative and fun solutions to address our concerns about student engagement and critical

thinking in our classes, two of the authors developed assignments using photography and web technology. We selected photography because it is familiar to the students, requires a limited acquisition of new skills, and is easily accessible (neither instructor has had a student without a camera phone or digital camera to date). Additionally, photographs may prompt thought or ways of thinking that are different from text or language based approaches (Harper, 2002). Harper (2002) suggests that from an evolutionary perspective visual images are processed by an older part of the brain and in a different way than language.

The two assignments utilized Photovoice and photo elicitation methodologies. Photovoice is a participatory research method that uses photography to examine community strengths and weaknesses to elicit social action (Wang & Burris, 1997). Photo-elicitation is the process by which photographs are introduced into the research process, typically during person-to-person interviews, for the purpose of eliciting responses to visual or symbolic representations (Harper, 2002). A description of the assignments follows: the first using an adaptation of Photovoice and the second using an adaptation of photo elicitation as strategies for the classroom.

Example 1: Photovoice Adaptation

The adapted Photovoice assignment was given to health science majors enrolled in two sections of the Use and Effects of Drugs ($n = 93$), a required course for public health education students and an elective for health studies students. The sample was overwhelmingly female (87, 13%), all between the ages of 18 and 24. During the first class meeting the instructor explained the assignment and the ethics of photo taking. All students were familiar with and owned digital cameras or had cameras on their cell phones.

The assignment required students to assess the environmental impact of alcohol and tobacco use on and around campus. Students were asked to take a total of 20 pictures over a four-week period and select five to eight of the ones that they felt best represented the environmental impact. The four-week period included "high-risk" weekends such as homecoming and parents' weekend. All 20 photographs were uploaded by the students to their Flickr account created at the beginning of the semester. Photos selected by the students were placed in a separate set on Flickr for the instructor to grade. The students answering the following items narrated the five to eight selected photographs:

Describe what is happening in your photograph. Why did you take a picture of this? What does this picture tell us about the environmental impact of

alcohol/tobacco on campus? How does this picture provide opportunities for us to improve the environmental impact of alcohol/tobacco on campus?

Each student also had to submit to the instructor a one-to two-page reflection paper describing their thoughts on the project and any suggestions for improvement. Since the first semester the project was put into place, the instructor, based on students' suggestions, has changed the duration of the assignment, and the process for uploading photos to Flickr and has amended the project requirements to include the social and cultural impact of alcohol on campus in addition to the environmental impact. The assignment was amended as the initial photographs were repetitive and lacked some of the creative engagement sought in assigning this project. For example, within the topic of environmental impacts, the majority of photographs depicted trash initially. After amending the assignment, the photographs included images of the party scene, the liquor outlets/establishments and their proximity to campus or housing, property damage, personal injury, etc. A complete description of the assignment can be found in Appendix A. Figure 1 includes examples of student work.

Example 2: Photo-elicitation Adaptation

The present assignment began with an investigative photography task (Photovoice) elucidated by photo elicitation. In this case photo elicitation was used to provide individual interpretations of common pictures. The assignment was given to two sections of the introductory course for the health sciences major ($n = 75$); as in other courses within the major the sample was predominantly female (68, 91%), with the majority of the students (99%) between 18-24 years of age.

Students were guided by the following instructions: Each student should take one photograph representing each of the given 10 dimensions of health, for a total of 10 photographs. Photos must be taken by the student within the semester of the assignment. Pictures are to be taken in spaces/places that are considered public and saved into a digital format. Students are assigned to a group and asked to upload their photos into a group folder on the class Shutterfly page created by the instructor. Groups select one "best" photo from each dimension, without discussing reasoning for their vote selecting a photo. This version of nominal group process voting is repeated across the groups, with the class selecting one photograph to represent each dimension from those selected best at the group level. Each student then offers his or her own unique perspective on the ten photos selected by the class. Students are asked to write a thoughtful and well-

Figure 1
Examples of Student Work

constructed response to each photograph guided by some prompts the instructor provided in the assignment description (e.g., How do you interpret this space/place? Whom would you expect to use/be in this space or place?). A complete description of the assignment can be found in Appendix B. Following the write up, a class debriefing and discussion is facilitated by the professor tying content topics from the semester to the experience and insight gained from the photographs. This debriefing is essential in returning to the purpose of the assignment, the photographs were not taken just to have a picture.

Both of the described photograph assignments are used to heighten awareness about environments around them, to communicate what individuals see with their peers, and to provide an opportunity to create discourse about how these items impact health. These are among the expected benefits of using engaging, creativity based assignments. Benefits of the assignments are explained further in the following paragraphs. Figures 2, 3, 4, and 5 below, are representative of photographs selected by classes as representing dimensions of health.

Takeaways

Benefits

Using photography in classroom assignments provides a creative way to simultaneously address two separate issues: awareness of social problems or determinants of health and engagement in critical thinking. It is surprising to think how unaware students may be of their environments; however, their reflective responses to photographs indicate that they have been able to see an issue from a new perspective when it is represented by photographs and when they are given the time and space to engage with such representations. Responses indicate students have an increased awareness of social and environmental determinants of health within their home and local communities. For example students using Photovoice to examine alcohol culture on campus suggest that students

> lose control [*sic*] that they do not care about their surroundings or the consequences of their actions all for the sake of a good time. This picture provides an opportunity for us to recognize the problem and the negative impact alcohol can cause on a campus.

Photo-elicitation responses included statements like, "These pre-determinants of economic health can provoke many stereotypes concerning people that live in houses such as this one."

According to previously discussed components essential for the development of critical thinking, the described assignments directly challenge students to perceive and capture via photographs both the positive and negative aspects of health in their environments. Subsequently, they interpret, analyze, evaluate, make inferences, and explain the image they captured. The assignment thereby makes use of the majority of constructs for improving critical thinking (Facione, 2011) and encourages students to engage in both reflection and self-analysis. The time frame of the assignment allows the instructor and student to see the initial deficiencies in the critical thought process, as well as provides a learning opportunity for the student to address that challenge. Additional benefits, not related to critical thinking, included a decrease in costs compared to traditional photography assignments and

Figure 2
Social Justice or Equity in Health

Figure 3
Economic Health

Figure 4
Physical Health

Figure 5
Social Health

faster turnaround time. Further, the use of online photosharing applications, (e.g., Flickr and Shutterfly) allowed participants to share photos and see or discuss the impact of the photos in real time. Allowing students to work in groups asynchronously online allowed them to engage in group discussions or complete their portion of the assignment without having to organize times they were all available to meet.

In the present example one instructor (Photovoice) permitted students to self-select group members or work independently, while the other instructor (photo-elicitation) assigned members to their groups, attempting to disperse academic interest areas, gender, and year in school. In both cases the structure of the group work minimized opportunity for grading difficulty in that grades were earned independently of group work. This real time but asynchronous use of group work has been a helpful approach in managing larger class size and combating some of the typical experiences of group work (e.g., not meeting group deadlines)

Challenges/Limitations

Because many students are cognitively disengaged they expect good grades purely by memorization of material with limited engagement on their part. Asking students to participate in an assignment that pushes them to be creative, engaged with the topic, and willing to think critically poses some challenges. One example of this is the delicate balance of giving examples without hindering students' independent thinking and creativity. Providing examples of photographs prior to students beginning the assignment seems like a good idea, but the present authors have found too much discussion often limits students' willingness/ability to think creatively and by implication, think critically. Yet, students often dislike ambiguity; subsequently, there is a fine line between providing parameters for the

assignment but not binding the student's approach with pre-conceived notions rather than the ones found in their local and home communities.

Similarly, when students were asked to suggest possible prevention or policy changes to limit the negative consequences associated with the behavior in their photographs, they were at a loss. The overt result of the failure to engage the topic or critical thinking responses is seen in repetitive interpretations and superficial suggestions for activism. For example, regarding the photo elicitation responses for economic health, many students' comments reflected how "sad it is people live that way" or equally as superficial that "economic disparities have an impact on health." Less engaged students tended to use very little variation across categories of responses, reflecting minimal creative thought, engagement, or critical thinking was used. Another example of difficulty engaging the topics thoughtfully could be found when asking students for policy implications of their photographs. Thoughtful responses could have included things like the addition of bike lanes or improvement of sidewalks for physical activity or the support of recycling through increasing drop-off locations may decrease litter and improve impacts for environmental health; however, students who failed to engage frequently responded that the university "should provide more trash bags" or "make it easier to recycle." When students failed to engage the topic, critical thinking responses became repetitive in interpretation and suggestions for activism.

Technology Difficulties

In addition to the resistance to alternative assignment formatting, there is also some resistance to the development of computer and web sharing literacy skills. Though the presumption is most traditional aged students represent a very technologically literate demographic, in fact there are widely varying levels of

technological competency, especially when it comes to using photo sharing or photo editing applications.

Within the photo-elicitation project, a Shutterfly website malfunction occurred with one class, which prevented them from tagging photos to mark them as selected. Customer service was unable to offer any explanation for the failure. Sometimes technology inexplicably fails, though the instructor followed every available option to rectify the situation, but in the end the photographs had to be manually reposted in a new folder in order for students to be clear what photographs had been selected.

Locating the instructor within Flickr was difficult for the students. Many of them forgot their screen names, which made it difficult for the instructor to locate them within Flickr. Initially the instructor was limited by the storage space available within Flickr and finally purchased unlimited space. Students had a limited understanding of how to make images private and only available for instructor to view. Even after a brief overview, the students struggled with creating groups and sets within Flickr.

IRB Issues

We would be remiss if we did not mention institutional review boards (IRBs) as a possible challenge associated with extending these photography assignments for research purposes. The classroom use of these projects did not require IRB approval. However, if instructors are intending to use their findings in a publishable form, they must obtain approval from their institutional IRBs.

Accessibility Issues

It is possible some students may not have access to digital cameras or smart phones; however, this has not been our experience. Even the simplest phones these days tend to have a camera, and further, students assert that having a camera on their mobile phone is a necessity for the social media sites they regularly use (e.g., Facebook). All students enrolled at the referent university have access to computers on campus.

Conclusion

It was the hope of the instructors that students would be exposed to a variety of images that would challenge their thinking about the health culture in their lived environments and allow them to critically investigate and interpret their photos and the photos of their classmates. It was also an opportunity for the students to have conversations with their classmates about the images and the messages about health that the images conveyed. The immediate impact of these assignments appears to have achieved these goals and initiated engagement with the course content and the development of improved critical thinking skills. Based on the student reflection papers and classroom discussion, students were challenged by the images. Students in the adapted Photovoice assignment reflected that they found the assignment to be eye opening. They reported feeling embarrassed and disgusted by the lack of responsibility others take for their actions (e.g., trash, property damage, vandalism) and the lack of understanding they have paid to their own environments. A few thoughts expressed in reflection papers include, "Before the project I had not really thought much about it. . . . [I]t really opened my eyes to the amount of high risk behaviors and stupidity that happens" regarding alcohol use; similarly, the project increased awareness about the importance of "alcohol as a community, and how reliant we are on drugs and alcohol to have a good time." It is less clear if the newfound awareness will be sufficient to motivate behavior change (particularly in the case of commonly accepted patterns of alcohol use). Regrettably, it is unclear whether these feelings were enough to prompt a change in behavior.

Though pushing students for engagement with course topics and increasing their critical thinking may face some resistance from students, it continues to be an important facet of what they should take away from their experience in higher education. As such, managing the delicate balance of what is prepared for them versus what they need to arrive at through their own efforts can be a tenuous process. As previously mentioned, students often dislike ambiguity; however, providing examples of photographs from previous semesters or too much discussion about what constitutes each photographic category often limits students' willingness/ability to think creatively and, by implication, think critically. Similarly, when it comes to describing assignment expectations, both instructors provided in class discussion, question and answer opportunities, and handouts with step-by-step instructions (see Appendices) to the students but frequently found some difficulty in getting students to problem solve individual based problems (e.g., their cameras were new and they did not know how to get the photos onto their computers, their computers' software was older and therefore the instructions did not exactly match). From the instructor's perspective, one can both appreciate students feeling momentarily frustrated by an unexpected event and yet also that their hesitation to pursue a solution on their own underscores the importance of this type of assignment. This persistent difficulty in thinking creatively and critically may reflect the absence of that type of thinking and problem solving in their educational experience thus far, though it is a very important, practical, and helpful skill for future professionals to acquire.

One closing recommendation would be the continual development of these assignments leading to a distal assessment (e.g., a one year follow-up) evaluating whether newly gained understandings increase self-reflection or behavioral awareness, or whether they initiate behavior changes maintained over time. However, for the present purposes the instructors have been pleased with the increased engagement of the course content outside of the classroom setting and the initial indicators of improved critical thinking skills.

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Appendix A
Photovoice Project Description Handout for Students

PHOTOGRAPHY PROJECT
- Each student is responsible for taking 20 photographs between 9/27/2009 – 10/18/2009 that represent the environmental impact of alcohol on campus. There are to be no images with human beings.
- You may use a digital camera or the camera on your phone. If you do not have a digital camera or a camera on your phone, please see me.
- Create a Flickr account and make me a contact so I can see your images. Please make your images private and available for only friends and family to see.
- After you have uploaded all 20 images please select 5-10 photographs that you feel BEST represent the environmental impact of alcohol/tobacco on campus.
- You may work alone or with a small group of no more than 4 people. If you work in a group you will select 5-10 images from the 60-80 your group has uploaded.
- Once you have selected your photographs, "freewrite" using the "PHOTO items below. Use the "comments" feature in Flickr to "freewrite."
- When you are finished move your final selections into a new set for me to grade.
- Identify any common themes that emerge. To create a theme you should have at least 4 compelling photographs and stories that emerge.
- You want your photographs and their "freewrites" to tell a story. How do you feel about what you see? How would you like to see it change? What suggestions do you have to help make those changes?

PHOTO
1. Describe your **P**hoto
2. What is **H**appening in your picture?
3. Why did you take a picture **O**f this?
4. What does this picture **T**ell us about the environmental impact of alcohol/tobacco on JMU's campus?
5. How does this picture provide **O**pportunities for us to improve the environmental impact of alcohol/tobacco on campus?

REFLECTION
1. Describe what you thought about the project.
2. What surprised you most about what you photographed?
3. What specifically did you learn about the alcohol/tobacco culture here at JMU?
4. Did you realize anything about the culture (alcohol/tobacco) here that you hadn't thought of from doing this project?
5. What suggestions do you have for addressing any of your concerns about this issue (think in terms of JMU leadership, law enforcement or any other decision making group on campus)
6. Are there any suggestions for how to change or make the assignment easier, better, etc.?

Appendix B
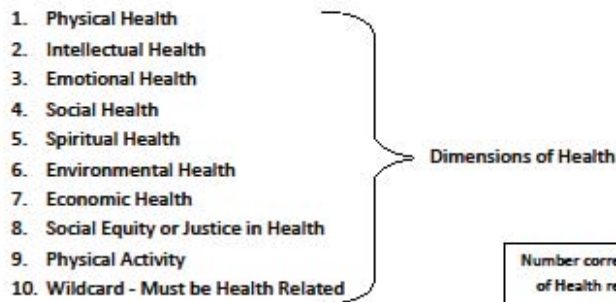Photo Elicitation Project Description Handout for Students

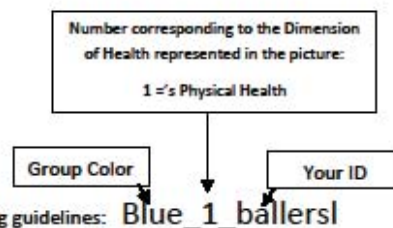**Photo Elicitation Project**

Key elements to good photographs
o   Photo composition (foreground & background, main focal point(s), proximity / distance to main focal points)
o   Other issues: clarity of picture (hold camera still), camera angle / point of view, landscape vs portrait, color vs black and white, movement within picture, depth of field, light exposure, flash photos.
o   <u>Persons must not be identifiable in the pictures</u>. Obscure identifying features (face, tats, etc) carefully so as to protect the identity of any individual captured therein, but also without compromising the integrity of what the photograph is representing.

Procedure:

Each person one picture representing each of the following categories (total of 10 pictures). Pictures are to be taken in spaces/places that are considered public. Under no circumstances should a picture be taken that would in any way violate any person's privacy or security. The content of all pictures should be considered appropriate for class.

1. Physical Health
2. Intellectual Health
3. Emotional Health
4. Social Health
5. Spiritual Health
6. Environmental Health
7. Economic Health
8. Social Equity or Justice in Health
9. Physical Activity
10. Wildcard - Must be Health Related

Dimensions of Health

Number corresponding to the Dimension of Health represented in the picture:

1 ='s Physical Health

Remove all personal identifiers in the pictures!

| Group Color | | Your ID |

Pictures are to be saved into a digital format using the following guidelines: Blue_1_ballersl

Upload files to the appropriate group folder on our Shutterfly webpage.

DO NOT DISCUSS YOUR PICTURES WITH EACH OTHER! *I cannot stress this enough!*

Group members will look at all pictures from their group and select one "best" photo from each dimension, this is to be done WITHOUT discussing the photos. As a class we will vote among the group best pictures to select a class-wide best photo to represent each dimension.

Each individual will then use the format shown on the next page to write a response to each picture chosen by the group. Again, this is NOT to be discussed. Each person should offer their own unique perspective on the ten photos selected as "best" by the group. It is imperative that these perspectives are not biased by discussion.
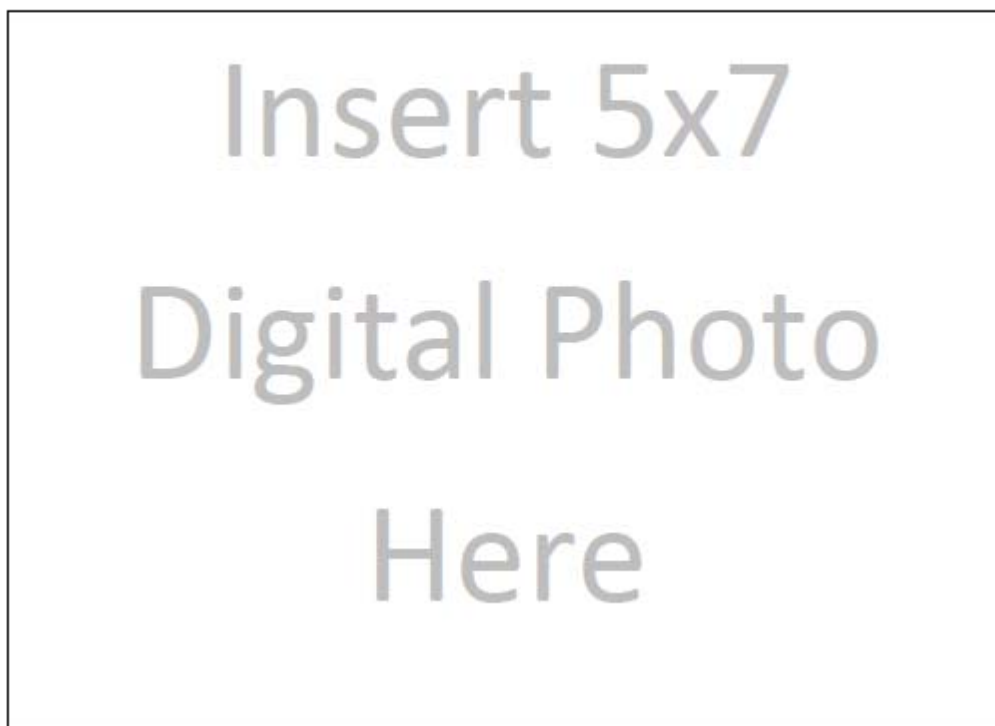
Dimension 1 – Physical Health (Blue Group)

Use the space below the picture to write a thoughtful and well constructed response to the photograph. How do you react to this photo? How do you interpret this space/place? Who would you expect to use/be in this space or place? Do you attach any stereotypes to it? Does this space/place facilitate health or act as a barrier to health? Do you think your experience of this space/place varies from how other people experience it?

Your response should be single spaced. Use paragraph form and complete sentences. Your response should be no fewer than 10 sentences, and as long as you need to clearly articulate your feelings regarding the space/place represented in the photo. Though the response is your opinion, it is expected that it will be a very well written, concise response. (This means you should write it and then go back and edit it on at least two separate occasions – more if you do not have strong writing skills).

Each picture should start a new page. Page numbers should appear in the lower right of each page.

Submit these papers electronically to Digital Dropbox on Blackboard prior to the class it is due and submit a stapled hardcopy at the beginning of class on due date.