Review

Expanding Occupational Health, Safety, and Well-Being Education in Undergraduate Curriculums

Kaitlin M Gallagher *, Yuanlu Niu , Sarah Lueke

Posted Date: 17 January 2024

doi: 10.20944/preprints202401.1271.v1

Keywords: ergonomics; management; workforce development; human resources; curiosity; systems thinking; human capital theory; transformative learning theory; organizational leadership.

Review

Expanding Occupational Health, Safety, and Well-Being Education in Undergraduate Curriculums

Kaitlin M. Gallagher [1,*], Yuanlu Niu [2] and Sarah Lueke [3]

[1] Exercise Science Research Center, College of Education and Health Professions, University of Arkansas, Fayetteville, AR, USA; kmg014@uark.edu
[2] Human Resources Development, College of Education and Health Professions, University of Arkansas, Fayetteville, AR, USA; yn005@uark.edu
[3] Department of Management, Walton College of Business, University of Arkansas, Fayetteville, AR, USA; slueke@uark.edu
* Correspondence: kmg014@uark.edu

Abstract: To meet the calls of the International Labor Organization and National Institutes of Occupational Safety and Health, this paper discusses how to build Occupational, Health, Safety (OSH), and Well-Being competence by expanding education to non-traditional undergraduate disciplines. The authors provide (1) theoretical background on why this would benefit society as a whole, (2) learning theory strategies for teaching OHS and Well-being outside of traditional majors, (3) case studies of how this can occur in undergraduate classes and (4) opportunities and challenges for the future.

Keywords: ergonomics; management; workforce development; human resources; curiosity; systems thinking; human capital theory; transformative learning theory; organizational leadership

1. Introduction

To meet the changing demands and future of work, Occupational Safety and Health (OSH) leaders have called for expanded training of OSH professionals in topics such as (but not inclusive of) applied economics, sociology, human relations, education, and business [1]. Such calls are found in other professions, such as medicine[2]; however, like those professions, it is difficult to insert all proposed topics on top of the courses deemed necessary for expanded training without overcrowding the curriculum[2]. Another path is to expand OHS education across disciplines. The International Labor Organization (ILO) highlighted *"Building Competence in OSH"* as an opportunity to respond to safety and health challenges [3]. Rather than solely learning about OSH "on the job," we could … "mainstream OSH into the core of general education for everyone before they enter the world of work and continuing throughout their working lives[3] (p. 59)". To meet this demand, our paper calls for simultaneous training of students outside of OSH rather than relying on OSH professionals to make up the knowledge burden on their own. This paper will focus on the role of higher education in building OSH and well-being competence in *undergraduate* students outside of typical OSH fields. We focus on undergraduate students as this is when students are considering career and post-secondary education opportunities. We propose four overarching benefits of such training:

1. Increase general awareness about OSH and well-being in our society.
2. Enhance understanding of work design concepts, programs, and policies supporting OSH and well-being.
3. For future leaders, consider their role in supporting their employees' OSH and well-being.
4. Facilitate interest for students to pursue careers related to OSH and well-being that they were not previously aware were possible.

This paper will be split into four sections. The first section will expand on the theoretical background of the advantages of teaching students from non-traditional majors about OSH and well-being. The second section will review two learning models that can assist in teaching OSH and well-being to initiate learning. The third section will provide two case studies demonstrating teaching

 doi:10.20944/preprints202401.1271.v1

OSH and well-being beyond the typical disciplines. The fourth section will discuss opportunities and challenges to expanding this training.

2. Theoretical Background for Building OSH Competence of Undergraduate Students

2.1. Systems Research and Ecological Models

A system is "a set of elements or parts coherently organized and interconnected in a pattern or structure that produces a characteristic set of behaviors"[4] (p. 188). Socio-ecological models are one example of how systems thinking has been applied to health and occupational safety. These nested or hierarchical models occur when sub-systems are organized within a higher-order sub-system, which may be organized within an even higher sub-system[4]. An example applied to OHS and well-being is the recent model presented by Sorensen and colleagues[5]. The individual worker is a sub-system within an organization, a sub-system of larger employment and labor patterns, which is ultimately part of the broader social/political/economic environment[5]. NIOSH's Total Worker Health (TWH)® framework is also an example of a socio-ecological model emphasizing that many work system elements influence a worker's health[6]. Typical research and education models may only look at one sub-system at a time while ignoring the important relationships *between* sub-systems. For example, educating only future OHS professionals on their ever-expanding role ignores the relationships and understanding that must be formed between the other sub-systems they will interact with throughout their organization. One way to address this could be to educate other members of the hierarchical sub-system (for example, future managers) about the benefits and challenges of implementing OHS and well-being initiatives. A benefit to a hierarchical system is that not every member needs to know the details required to successfully implement initiatives[4]. However, understanding OHS and well-being concepts, appreciating their relevance and potential contribution to organizational success, and recognizing the role of other sub-systems may increase the likelihood of gaining the managerial support necessary for success[7].

A potential challenge within hierarchical systems is that if each sub-system's goals do not align, it may result in a suboptimal product[4]. For example, the worker and organization sub-systems' goals may not align with each other, and the function of the overall organization suffers as a result. This concerns OSH and well-being because these initiatives are implemented across the boundaries of sub-systems; however, the value of changes may not be perceived to benefit the goals of each subsystem equally. An example is the Human Factors and Ergonomics (HFE). Human Factors and Ergonomics is a design-driven systems approach focusing on performance and well-being[8]. Well-being and performance are related and are needed for *joint optimization* – designing the technological and personal sub-systems should be designed simultaneously and consider one another [9]. Despite this dual and inter-connected purpose, the value proposition is not always equally perceived across the system[8]. HFE is typically perceived as providing health, safety, and well-being solutions that are valued by the workers; however, these are *dependent stakeholders* in that they are invested in the outcomes but are not as influential in (re)designing the organization[8]. These outcomes are not always valued by organizations and, in some instances, can be seen as threatening[10]. Sub-systems that contain the technical experts and designers value their specific definition of "performance"[8]; however, a functioning hierarchical subsystem requires the upper layers of the hierarchy (e.g. ,managers and designers) to serve the purposes of the lower layers (i.e., workers) while also balancing the values of the sub-system and the total system[4]. Dul and colleagues[8] recommended that strategic action for HFE was to educate future stakeholders across the system through formal (e.g., school curriculums) and informal (i.e., community outreach) methods.

2.2. Human Capital Theory

According to the human capital theory, investments in education generate private and social returns[11]. OSH and well-being education are important investments that align with the principle that both "individuals and society derive[d] economic benefits from investments in people"[12] (p.341). In occupational safety, the educated workforce becomes a pivotal asset. They can ensure their

 doi:10.20944/preprints202401.1271.v1

well-being and mitigate risks, enhancing organizational productivity and societal welfare. This education equips undergraduate students with knowledge that directly impacts their individual performance and indirectly impacts organizational efficacy and societal safety norms, which echoes the observations of Nafukho et al. [13] and Hughes[14]. Therefore, providing OSH education to undergraduate students can bring a concurrent value and create a synergistic impact that contributes to individual, organizational, and societal advancement.

2.3. Limitations

There are a few limitations to intervention in undergraduate education for OSH and well-being competence. First, not all workers in a system will pursue undergraduate post-secondary education. They may not pursue additional education, pursue select certificantes, or attend a technical school. As a result, multiple pathways are needed to reach all members of the workforce. Second, the ILO report[3] calls for life-long learning before entering the workforce; however, many emerging adults may have already experienced working conditions in their adolescence that shape their knowledge, attitudes, and beliefs related to OSH and well-being. As a result, some education on OSH and well-being should be integrated even earlier (e.g., Young Workers' Health and Safety programs created by the Labor Occupational Health Program at UC-Berkeley[15]). Finally, many individuals have been part of their work systems for years and will not return to formal higher education; as a result, community outreach (whether through organizations or professional organizations) must occur to transfer this knowledge to existing members.

3. Learning Models for Building OSH Competence of Undergraduate Students

3.1. Situational Curiosity

There are different ways that an instructor can utilize a student's interest to help them engage in the material during their course. The first is through *individual/personal interest*, which is "relatively stable motivational orientation or personal disposition that develops over time in relation to a particular topic or domain and is associated with increased knowledge, value, and positive feelings[16] (p. 152)". This would be an example of teaching OHS and well-being to students who are pursuing undergraduate degrees on this topic. In these cases, those "…who are interested in particular activities or topics pay closer attention, persist for longer periods of time, learn more and enjoy their involvement to a greater degree than individuals without such interest[16] (p. 153)."

But what about if students are not interested or, in many cases, unaware of a topic? This may be the case when educating students whose majors, on the surface, are unrelated to OHS and well-being. An example is an Exercise Science student who entered their major because they are interested in sports or injury rehabilitation. In this case, the instructor cannot depend on personal interest when wanting to teach a topic like OHS and well-being. Rather, the instructor can develop a *situational interest* in the topic, which is "… generated by certain conditions and/or stimuli in the environment that focus attention, and it represents a more immediate affective reaction that may or may not last [16](p. 152)" and, these interests "play an important role in learning, especially when students do not have pre-existing individual interests in academic activities, content areas, or topics[16] (p.153)."

While situational interest is a way to create awareness in OHS and well-being topics, it may not always lead to personal interest[17]. The researchers proposed a four-phase model of interest development[17]:

1. Triggered Situational Interest: Creation of short-term changes in affective and cognitive processing that can occur through environmental/text factors such as surprising information or personal relevance. External factors likely initiate this interest and may be a precursor for an individual to be motivated to re-engage with the information later.
2. Maintained Situational Interest: This phase involves more focused and persistent attention to a topic. It is, again, typically externally supported. A student's interest may be held in a topic because of the meaningfulness of the tasks and personal involvement.

 doi:10.20944/preprints202401.1271.v1

3. Emerging Individual Interest: Based on a student's previous engagement with a topic, the student will engage with this content again if provided with the choice to do so and will now generate questions and curiosity. This phase is highlighted by self-generated interest but may require external support and encouragement.
4. Well-Developed Individual Interest: With more positive feelings, stored knowledge, and stored value than in the previous phase, a student's pursuit of a topic or curiosity questions continues to be self-generated and is resourceful for how to answer these questions, which results in sustained long-term interest. While they may still rely on peers or experts to assist with understanding, they are more likely to persevere in the face of frustration.

Educators can help students sustain their attention for tasks by creating an opportunity for situational interest to be triggered[17]. In his book *Distracted*[18], Dr. James Lang discusses the development of situational interest to maintain engagement in the classroom. He recommends the use of "connection notebooks" to "create connections between [the] course content and the perspectives [the student] brings to the class"[18] (p.191). This allows students to generate questions about the content and link it to other courses or aspects of their personal lives and interests[17]. During the initial stages of interest development, it is also important to develop positive feelings on a topic and provide external support through content engagement[17].

Occupational health, safety, and well-being leaders can identify ways to trigger situational interest amongst students in non-traditional majors. A well-supported curriculum and feedback could lead to students pursuing careers or post-graduate education in OHS and well-being fields they did not know existed. It would be interesting to know if such foundational knowledge, even if not developed beyond the maintained situational interest phase, helps these individuals to develop relationships with the OHS and well-being experts in their future organizations. An important factor in moving beyond situational interest is when the individual re-engages with the information[17]. If a student takes a course and does not continue to engage with the material, it is unknown if the student will successfully bring that knowledge into the workforce. Specifically, it is unknown if an individual who took OHS and well-being courses would be more likely to engage with their organization's OHS and well-being experts or consider that value in their management practices.

3.2. Transformative Learning Theory

Transformative learning theory (TLT) was developed to explain how adult learners change their way of perceiving, interpreting, and interacting with the world while learning new information[19]. It also explains how learners interpret, validate, and reformulate the meaning of their experience. This theory has been utilized as pedagogy by educators in training health professionals globally[20]. There are ten phases of learning in the transformative process[19] (p. 19):

1. A disorienting dilemma
2. Self-examination
3. A critical assessment of assumptions
4. Recognition of a connection between one's discontent and the process of transformation
5. Exploration of options for new roles, relationships, and actions
6. Planning a course of action
7. Acquiring knowledge and skills for implementing one's plan
8. Provisional trying of new roles
9. Building competence and self-confidence in new roles and relationships
10. A reintegration into one's life based on conditions dictated by one's new perspective

Implementing TLT in teaching OSH and well-being outside the traditional pathways should foster an environment where students critically analyze and reassess their assumptions and beliefs about OSH and well-being practices. For example, the instructors can engage students by presenting disorienting dilemmas, such as real-world cases where established OSH protocols have failed or resulted in unforeseen complications. This encourages students to review existing safety norms and urges them to reflect on their understanding and beliefs concerning OSH. The instructors should include activities and discussions that provoke reflection on students' current understanding and

 doi:10.20944/preprints202401.1271.v1

open dialogues for them to listen, comprehend, and debate diverse perspectives and experiences related to occupational safety.

Beyond reflection and discourse, transformative learning encourages students to apply their new understanding in practical contexts[21]. The instructors should develop learning experiences that allow students to implement their reshaped perspectives and insights on OSH protocols into real-world scenarios through projects, simulations, or partnerships with organizations. Continuous assessment and feedback should be included in this journey to aid students in refining their application of safety knowledge[22]. With a foundation rooted in transformative learning, students will acquire knowledge on OSH and well-being while navigating a personal and collective journey of reshaping their understandings and approaches towards creating safer and healthier occupational environments in their fields.

4. Case Studies of Undergraduate Courses

4.1. Health in the Workplace Undergraduate Course

"Health in the Workplace" began as a Special Topics course during the Spring 2021 semester at the University of Arkansas by one of the study co-authors (KG). While this class was originally offered as an Exercise Science (EXSC) class opened to the entire university, it was also an opportunity to explore the dual value proposition (human well-being and performance) of workplace health initiatives by recruiting management students to the class. A second Special Topics in Management (MGMT) was created and offered as a combined section with the Exercise Science class through a previous collaboration with the Department of Management. An important part of this collaboration was that Management students would enroll under an MGMT course code, which facilitated the inclusion of this course as a management elective without an advisor needing to provide an exemption. All other students enrolled under the EXSC course code. An overview of the course offering the Spring 2021 (virtual) and Fall 2022 (in-person) lectures is provided in Table S1 (Supplementary material), with highlights provided below.

4.1.1. Course Format and Enrollment

The Spring 2021 offering was based on the NIOSH (TWH)® framework[6]. Thirteen students enrolled from a mix of majors (eight from Exercise Science, two from Management, and one student each from Biology, Human Nutrition and Dietetics, and Public Health). Due to the pandemic, the course contained both synchronous and asynchronous lectures. In Fall 2022, the course was offered as an in-person offering. Thirty-five students enrolled in the combined sections of Special Topics courses (10 Management Majors/Minors and 15 Exercise Science students). Most students were in the third and fourth year of their undergraduate degree.

4.1.2. Intended Learning Outcomes and Topics

The intended learning outcomes (ILOs) and topics for the initial offering were based on the instructor's previous knowledge and ability to turn around the lectures quickly while teaching virtually. The Spring 2022 ILOs and topics revolved around systems that discussed the interplay between individual, organizational, and sociocultural levels. Topics were based on the instructor's knowledge and the availability of generous guest lecturers who were experts on their topic.

4.1.3. NIOSH content

In Spring 2021, the Healthy Workplace Participatory Program (HWPP), designed by CPH-NEW, NIOSH Education and Research Center [23], was used as a class project. The class was split into two design teams, and baseline data on student health was provided by the *Exercise is Medicine on Campus*[24] baseline health surveys. The instructor was the leader of one design team, and a graduate student acted as the lead for the second design team. Three meetings occurred, where students identified (1) student mental health and (2) student dietary needs as the problems they wanted to

 doi:10.20944/preprints202401.1271.v1

target. Students were then allowed to choose what they were most interested in to identify root causes and potential solutions. These assignments were graded on a "completion" basis by participating in the synchronous virtual lessons and submitting worksheets at the end of the class.

The Fall 2022 course utilized the University of Illinois Chicago's Center for Healthy Work online educational game, "In a Year's Work™"[25]. This game brings students through the "life" of a Temporary Warehouse Worker, HR Manager, or CEO (a Call Center Representative was added in a later version). Students were asked to go through each "life" and then comment on what they found interesting and confusing and what new questions they had after playing the game.

4.1.4. Reflection Assignments

Aside from traditional tests that covered the basic content, reflection was a key part of this course and integrated into all assignments. Students entered the course with little to no experience learning about workplace health, so initial reflections were spent relating the content to their lives and enhancing situational interest. A powerful way to do this is using an image reflection. An image reflection assignment asks students to find an image representing their initial reaction to a given prompt. In this case, the question was, "What is the first thing you think of when you think about workplace health?" Students are also asked to accompany this with a 50-100 word justification of their image. At the end of the course, students re-answer this question given what they learned in the class.

Another method was the use of "connection notebooks" as suggested by Dr. James Lang[18]. On the first day of class, students wrote about their favorite and least favorite jobs and then identified common themes in discussion with classmates. Students could write down their thoughts before talking in class or asking questions during guest lectures. While they did not have to ask the questions out loud, students were required to write down at least three questions for guest lectures. These connection notebooks acted like "attendance points" - Students could miss a fixed number of entries before their grade was affected.

Finally, an example of a mid-semester reflection was called a "Past/Present/Future reflection." Students were asked (1) what was the most interesting thing they had learned so far, (2) what is something they can find in a recent news article or social media post that discusses workplace health, and (3) what topic they are most interested in discussing during the next half of the semester.

4.1.5. Focused Assignments

There were five individual assignments in Fall 2022. The first was to use the hierarchy of hazard control to identify the prevention of a hazard for a job of their choice. This assignment was originally piloted in a biomechanics class, and students had a meaningful experience taking a sports injury that they were interested in and trying to identify a way to prevent or eliminate the risks of the injury. As a result, students were allowed to choose a sport or a task for this class. This was another way of allowing students to enter this content with something they were interested in outside class. Beyond identifying the potential solutions, students were asked to consider why some solutions are more often implemented (e.g., individual or administrative controls) versus others (i.e., elimination). Interesting discussions about whether it is "possible" to eliminate the risk and what people perceive to give up when an elimination solution is implemented were very important for students to learn to understand the weighing of the well-being versus performance value propositions by different members of a system. For example, students who chose sports examples may have identified "shortening a season" as being helpful to reduce injury but also discussed how there could be a revenue loss that may prevent team owners from wanting to shorten the season. But if people are getting injured, should that matter? We then returned to discussions about OHS and well-being by discussing a similar value proposition.

The second assignment on exertional heat illness had students compare the *California Code of Regulations on Health Illness Prevention in Outdoor Places of Employment* [26] to the *American College of Sports Medicine* [27] and *National Athletic Trainers Association* [28] position statements related to training, competition, and fluid replacement when in the heat. Students were required to find

 doi:10.20944/preprints202401.1271.v1

information in the regulations that matched the evidence, statements that did not match or were too vague, and challenges of implementing heat acclimatization into work practices. You can find this assignment in the supplementary material of this article.

The third assignment was for students to perform an office ergonomics evaluation of their home workstation or a workstation on campus. All students chose their home workspaces and did well evaluating and making small changes based on recommendations. A common concern was that many of them lived in places where the furniture was provided to them or could not be adjusted.

The last two assignments were modified because of virus outbreaks on campus after Thanksgiving. As a result, students completed the assignments by attending class or individually at home. Both assignments had students reflect on course material. The fourth assignment had students identify information from previous lectures that discussed health equity and disparities. They also practiced cultural humility[29] by reflecting on potential biases they have and areas that they want to learn more about in the future. The final assignment had students read or listen to the children's book, "The Day the Crayons Quit"[30]. Students identified three stories from the crayons and related them to the topics we discussed in class. Both of these assignments can be found in the supplemental material of this article.

4.1.6. Future goals

At the time of publication, this course will be offered once more time as a Special Topics class before becoming a permanent course. This will allow for a third iteration of the course before finalizing the information in the course catalog at the University. A secondary goal is to survey occupational health and safety specialists about what they wish general workers and management knew about workplace safety, health, and well-being. A current limitation to the course (and many courses in general) is that the depth of content is usually based on the lecturer's expertise; therefore, continued relationships with expert guest lecturers and finding open-access content for students. A future goal is to better integrate methods to support situational curiosity and track how, if maintained, situational curiosity turns into emerging and well-developed individual interests when the students pursue their careers.

4.2. Organizational Leaership

Organizational Leadership (Leadership) is an upper-level management course taken as a requirement for management majors with a concentration in organizational leadership or as an elective for other majors. The learning module described here was developed as part of an asynchronous online course offered every semester. The course was designed to give students broad exposure to key leadership theories and concepts based on an interactional leadership framework containing the leader, follower, and situation [31]. Students explore leader traits, characteristics, and behaviors. They learn about coaching and development, leading individuals and groups, leading across cultures, fostering an inclusive workplace culture, and leading for employee well-being. The last section of the class investigates leading in different situations, such as leading a remote or hybrid workforce and leading change initiatives. Leading for Employee Well-Being is one of the fifteen weekly lessons in this Leadership class (Table 1).

Students reflect on their leadership strengths and development opportunities throughout the semester. They complete ten leadership self-assessment journals that correspond to that week's lesson. For example, taking a personality quiz and writing about how their personality and behavior style may influence leader effectiveness or identifying their top values in the workplace. At the end of the semester, students write a leadership reflection and development plan paper. The paper assignment asks students to integrate course material with the leadership strengths and development opportunities identified in their self-reflection journals. Students select two development priority areas and describe steps they will take over the next year to develop their leadership skills in these areas.

Preprints (www.preprints.org) | NOT PEER-REVIEWED | Posted: 17 January 2024 doi:10.20944/preprints202401.1271.v1

4.2.1. Typical Student Enrollment

The online Leadership class usually has between 40 and 50 students, all juniors or seniors. At least half of the students are online degree seekers, and the remainder are in-person students taking an online class in addition to their on-campus classes. Online students often have several years of work experience and many continue to work full-time while taking classes. Students taking Leadership represent many majors the College of Business offers, including general business, management, accounting, marketing, supply chain management, international business, innovation and entrepreneurship, and economics. A small number of students pursuing non-business majors have also taken the class.

Table 1. List of weekly lessons for organizational leadership.

Week	Topic
1	Introduction to Leadership
2	Power and Influence
3	Ethics and Values
4	Characteristics
5	Behavior, Skills, and Competencies
6	Follower Motivation and Satisfaction
7	Coaching and Developing Others
8	Leading Groups and Teams
9	Inclusive and Cross-Cultural Leadership
10	**Leading for Employee Well-Being**
11	Situational Leadership and Contingency Theories
12	Leading Change Part I
13	Leading Change Part II
14	Leading a Remote Workforce
15	Dysfunctional Leadership

4.2.2. Leading for Employee Well-Being Lesson Overview

The current version of this class was developed by one of the authors (SL) in 2022. The Society for Industrial and Organizational Psychology's (SIOP's) annual list of top ten workplace trends that year[32] included three trends related to employee well-being: #9: Employer's Role in Employees' Mental Health, #7: Stress and Burnout, and #5: Caring for Employee Well-Being. Two of the remaining top ten workplace trends focused on employee recruiting and retention in a candidate-driven market. While most large employers recognized the importance of supporting employee well-being before the pandemic [33], many added or expanded their well-being initiatives in response to the pandemic, the shift in applicant and employee expectations, and the challenging market for recruiting and retaining employees[34]. The timeliness and importance of promoting employee well-being drove the decision to include Leading for Employee Well-Being as a stand-alone lesson in this Leadership class. It is important for students to gain knowledge and skills that will allow them to effectively create and support a culture of wellness at work, both for themselves and their employees.

Each lesson in the online Leadership class includes learning objectives, required readings, videos, and assignments. Some lessons, including the one described here, also provide additional optional materials for students who want to learn more about a topic. The learning objectives for the *Leading for Employee Well-Being* lesson are listed below, and a summary of assignments and materials is provided in Table 2:

- Define employee well-being.
- Determine why organizational well-being initiatives are popular and consider the potential outcomes of such programs.
- Explore the role of a leader in employee well-being.

 doi:10.20944/preprints202401.1271.v1

- Evaluate effective practices for encouraging employee well-being and developing an organizational culture that supports this effort.

4.2.4. Required Reading and Videos

Two popular press articles are assigned[35,36] to give students an overview of the content and relevance of well-being to today's leaders and point out the risks of ignoring established best practices for managing people while implementing programs to support employee well-being. Meister[35] defines seven pillars of workplace well-being, cites research showing the high percentage of senior human resources leaders who consider physical and mental health a top priority in the workplace, and provides figures on the large amount of money currently spent on these initiatives. The second assigned reading is an article by Barton et al.[36]. This article raises the concern that organizations might increase employee stress by framing well-being at work as yet another task that employees must complete. They provide suggestions for supporting well-being without unintentionally adding to stressors already experienced by workers. The two assigned readings collectively provide an overview of the importance, spending, and challenges involved in organizational well-being initiatives.

Assigned videos include a lecture video developed for the Leadership class and a LinkedIn Learning course[37]. The lecture video was developed to define employee well-being, summarize the current and growing popularity of workplace well-being programs, provide examples of well-being initiatives explain potential benefits to the organization and employees, and share tips for implementing programs while ensuring they do not unintentionally increase stress. The lecture video also provides suggestions for leaders to consider before developing a new well-being program, all consistent with general leadership and management best practices. For example, it is important to ensure employees understand their roles, feel supported and included, and have opportunities to develop in their workplace. Finally, the lecture covers ways leaders can monitor the workforce for signs of burnout[38] and set technology norms to avoid telepressure[39].

The assigned LinkedIn Learning course is "How to Support Your Employees' Well-Being" by Amy Brann[37]. It is a 35-minute set of professional development training videos describing a leader's role in supporting employee well-being, recognizing and preventing burnout, and specific tips for addressing these issues in the workplace. Students taking the Leadership class have free access to LinkedIn Learning videos through the university's subscription.

Table 2. Summary of Leading for Employee Well-being Lesson.

Required Readings	Videos	Assignments	Optional Materials
The Future of Work is Employee Well-Being[35]	Lecture video	Discussion Board	Surgeon General Priorities for Workplace Wellbeing[40]
Stop Framing Wellness Programs around Self-Care [36]	LinkedIn Learning: How to Support Your Employees' Well-Being [37]	Self-Assessment: Well-Being	SIOP White Paper: The Business Case for Employee Health and Wellness Programs[41]
			NIOSH Total Worker Health® Program[6]
			Center for the Promotion of Health in the New England Workplace (CPH-NEW)[23]

 doi:10.20944/preprints202401.1271.v1

4.2.5. Assignment #1: Discussion Board

Students are asked to apply the concepts learned in class by completing two assignments for this lesson: a discussion board and a self-assessment. The discussion board asks students to describe an intervention and share their thoughts on its effectiveness (see supplemental material for instructions). In recent semesters, students have shared examples from their own workplace, experiences of friends and family members, and examples from the news. Students have been engaged and had much to say about this topic. Their initial posts ranged from informal, simple steps in small organizations to large, expansive programs in large corporations.

Many examples in students' original posts targeted employees' physical health. For example, providing healthy snacks and lunches, massages, apps to track steps or other healthy habits, department or company-wide fitness challenges, and stretching routines. Programs included in-person or virtual classes on nutrition, sun safety, smoking cessation, and exercise. Students also posted about programs focused on mental health and building community. For example, encouraging power naps during the workday, randomly assigning extra downtime referred to as "wellness breaks" at a busy call center, and allowing dogs in the workplace. One student had experience working in a social services organization where employees encountered difficult and stressful situations. The organization set up a quiet room with dim lights and yoga mats. Leadership encouraged employees to use it when they needed a break. Community building initiatives included employee resource groups (ERGs) based on demographics or shared interests, scheduling time for employees to volunteer during the workday, or having employees interact during a weekly dessert bar. Finally, many examples focused on work structure or schedules, such as shortened Fridays, remote or hybrid work, unlimited paid time off (PTO), offering "pawternity" leave to care for a new pet, and allowing employees to arrive late to work if they were exercising at the normal start of the workday.

Each student is also asked to respond to at least two other posts. Consistent with their original posts, students appeared to be quite engaged and gave thoughtful responses on potential challenges and solutions associated with the original post's suggestion. One student responded that they might ask their supervisor for mid-day exercise opportunities. Another student's interest was sparked enough to conduct additional research after an initial post mentioned the concept of psychological safety at work. The issue of needing to provide incentives (e.g., gift cards, permission to skip a meeting) and ensure that programs did not cause extra work was a common theme in student responses, with references to the assigned readings or their own experiences at work. Ineffective programs were discussed as well. One student mentioned a program they experienced at work. It was designed to improve mental health but kept employees at work long after their shift ended and resulted in increased stress levels. Another asked (not hypothetically) why an employer would pay for a smoking cessation program when the job was so stressful it made employees want to smoke more. Ensuring that physical activities were inclusive for all ability levels was also pointed out by students.

4.2.6. Assignment #2: Self-Assessment

The second assignment in the Leading for Employee Well-Being lesson is a self-assessment. This assignment asks students to consider everything they learned in the lesson and reflect on which programs would be most beneficial to them (see supplementary material for full instructions). As expected, responses have varied widely across students. Flexibility and work-life balance were common themes. Some students focused on physical and mental health; others pointed out that receiving fair and reasonable pay was a minimum requirement for their well-being at work. Programs specifically targeted toward increasing well-being, as well as general management practices, were all represented in student self-assessments. This is consistent with the wide variety of well-being initiatives currently in place at organizations.

 doi:10.20944/preprints202401.1271.v1

4.2.7. Student Response

This lesson was well-received by students and will hopefully be something they can apply in the workplace. As mentioned above, they have engaged with the material in the discussion board and self-assessment. Students have clearly experienced many workplace efforts related to improving employee well-being, whether they were labeled as such or not. The lesson described here exemplifies how employee well-being can be incorporated into management, organizational behavior, or human resources courses beyond the small amount (if any) of information typically available in a textbook.

5. Opportunities and Challenges

5.1. Start Small

To initially expand OSH and well-being training to students who typically do not receive the content, start small! Include examples and assignments in your class that link the content to a relevant OSH and well-being topic. Ask students to complete a reflection in class or as part of an assignment where they reflect on how their experiences with work are related to this content. Through this, the instructor can gauge student interest and compile data for the future to advocate for a new course on the topic.

Since there are not always ways in the tenure and promotion process to gain "credit" for the development of course material alone, instructors may consider how their work fits into "Boyer's Model of Scholarship" [42,43] - *discovery*, *integration*, *application*, and *teaching*[42]. For example, Boyer writes that integration means "making connections across disciplines, placing specialties in larger context, illuminating data in a revealing way, often educating non-specialists, too [42](p.18)". Such endeavors may also include *discovery* scholarship, as one needs to research the boundaries of their discipline and others before embarking on *integration* scholarship [42]. Many conferences have educational sections to disseminate this work where presenters can provide course development and evaluation information. Depending on the goal, the instructor may have to collect additional data on outcomes; therefore, discuss this with the Institutional Review Board first to see if approval and informed consent from students is required. These opportunities to present or write about experiences and application of educational models related to OSH are a way to gain peer-reviewed support for your work. If these topics also align with an instructor's values as an educator, such work is a way to discuss how to best educate future students on OSH and well-being with a larger group of scholars. The lack of time for such endeavors can be difficult to add to heavy workloads, so remember to start small!

5.2. Course Development within Majors

We have provided an overview of how OSH and well-being could be incorporated into existing and new curriculums for Exercise Science (Table S2) and Management (Table S3). This can involve creating separate courses or strategically including OSH and well-being material in existing courses; however, if only one instructor is teaching an OSH and well-being course, any change to their workload and availability may prevent the course from being offered. Second, adding material to an existing course with multiple instructors (such as an introductory course) will require buy-in from many individuals and feedback on what material to teach, what material is removed (if any), and how best to teach the material.

As examples, Exercise Science programs (Table S2) can integrate content into introductory and overview courses, biomechanics, environmental physiology, pubic-health related classes, and an elective targeting future health case workers, which is a common path for these students after graduating. Management programs (Table S3) can integrate content into overview classes on human resources management and/or organizational behavior, people analytics, talent acquisition and management, ethics and corporate responsibility, and organization change and development.

 doi:10.20944/preprints202401.1271.v1

5.3. Expanding Across Disciplines

While we provided examples for incorporating OSH and well-being content into courses within two types of majors, the expansion of OSH and well-being content can occur even further. One option for expanding this content is developing minors, certificates, or creating courses that meet general education requirements. There are several challenges and benefits to this approach. For example, general education requirements will vary between states and schools. Another challenge to this approach is balancing the faculty workload, the number of students within a major, and the ability to teach students outside the major. There may not be existing resources for classes that serve majors with high student enrollment to expand the class to those from different disciplines on campus. On the other hand, such courses may be a way to expand offerings in smaller majors by recruiting students from different disciplines. Before doing so, it is important to identify students you think would be interested and discuss with advisors and administrators in those colleges how best it would be to reach them. For example, the class with exercise science and management majors was a combined sections class, which removed barriers for management majors and minors. This method allows students from both majors to take the same class with the course code automatically accepted as an elective for their major. Taking a different course code would require administrative approval that would delay the process or possibly change from semester to semester. This can also create issues depending on how credit hour financial compensation is provided to departments on one's campus. These challenges are not reasons to avoid pursuing such initiatives, but to be effective, one must communicate with others on campus to be successful.

A second approach to expanding OSH and well-being education is to identify additional majors beyond exercise science and management that may be able to incorporate content into existing courses (such as psychology, sociology, marketing, engineering, or legal studies). Psychology courses covering health psychology, motivation, social psychology, or industrial and organizational psychology could provide lectures, readings, and assignments related to these areas. Marketing students might complete a case study or assignment on effectively marketing the benefits of employee well-being programs or safety initiatives to employees to increase participation rates. This approach is challenging because faculty in other disciplines may lack expertise or knowledge of OSH and well-being initiatives. Experts in these areas could encourage using these examples in other disciplines by hosting talks or events on campus to share ideas, partnering with faculty in other disciplines to write case studies, or offering to serve as guest speakers. Finally, it would be possible to create stand-alone degrees that cover these topics. An example is the Technology, Work and Health Masters of Science program at the KTH Royal Institute of Technology [52], which covers workplace health and safety topics along with coursework in environment management, leadership, and change management.

Finally, a third approach to expanding OSH and well-being education beyond the undergraduate curriculum is to consider how the university can educate community members in these areas. Many universities offer continuing education programs, outreach initiatives, or executive education classes to the local community. Experts on OSH and well-being could reach out to these areas on campus to propose sessions targeted to groups in the community. There is a wide variety of potential topics and audiences for such programs. They may focus on preventing specific types of workplace injury or general well-being at work topics. They might also have different target audiences, such as individual workers, small business owners, non-profit leaders, or professional associations.

5.4. The Role of Federal Agencies

In the United States, the "Occupational Safety and Health Act of 1970" states that "…Federal departments and agencies conduct, directly or by grants or contracts – (1) education programs to provide an adequate supply of qualified personnel to carry out the purposes of the [Occupational Safety and Health Act of 1970], and (2) informational programs on the importance of and proper use of adequate safety and health equipment[49] (Sec 21)." Currently, 18 Education and Research Centers (ERCs, [50]) and 10 Centers of Excellence for TWH® [51] exist in the United States to fulfill this

mandate. With the advancement of "Total Worker Health®" and the awareness that OSH and well-being require systems thinking, the ERCs and TWH® centers can continue to advance the mission by expanding and facilitating OSH and well-being to areas of greatest impact to TWH®. This could be through a specific mandate of the center or a resource that accumulates materials from all centers that promote how they can be incorporated across various undergraduate courses. Finally, it may be possible to expand or promote NIOSH's Training Project Grants (TPGs) to promote OHS and well-being undergraduate training beyond traditional OSH disciplines. Such initiatives will require a needs assessment and evaluation to ensure they facilitate the long-term promotion of OSH and well-being through a person's career or selection of post-graduate education.

6. Conclusions

We present a foundation and a call to action to expand OHS and well-being education to undergraduate curriculums to improve OHS and well-being across society. We encourage all those passionate about this topic to reach out to members at their institutions or local community to discuss issues and topics that would best serve students, workers, and organizations in their area.

Supplementary Materials: The following supporting information can be downloaded at the website of this paper posted on Preprints.org.

Author Contributions: Conceptualization, K.G., Y.N., and S.L.; writing—original draft preparation, K.G., Y.N., and S.L.; writing—review and editing, K.G., Y.N., and S.L.; funding acquisition, K.G., and Y.N. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by a University of Arkansas College of Education and Health Professions *Team Up for Education and Health* grant. The National Institute of Occupational Safety and Health (NIOSH) funded the APC.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Acknowledgments: MaryAnn Talley conducted initial research on the section for situational interest.

Conflicts of Interest: The funders had no role in the study's design, in the collection, analyses, or interpretation of data, in the writing of the manuscript, or in the decision to publish the results.

References

1. Schulte, P.A.; Delclos, G.; Felknor, S.A.; Chosewood, L.C. Toward an Expanded Focus for Occupational Safety and Health: A Commentary. *Int J Environ Res Public Health* **2019**, *16*, doi:10.3390/ijerph16244946.
2. Slavin, S.; D'Eon, M.F. Overcrowded Curriculum Is an Impediment to Change (Part A). *Can Med Educ J* **2021**, *12*, 1–6, doi:10.36834/cmej.73532.
3. International Labor Organization (ILO) *Safety and Health at the Heart of the Future of Work*; 2019.
4. Meadows, D.H.; Wright, D. *Thinking in Systems: A Primer*; Chelsea Green Pub: White River Junction, Vt, 2008; ISBN 978-1-60358-055-7.
5. Sorensen, G.; Dennerlein, J.T.; Peters, S.E.; Sabbath, E.L.; Kelly, E.L.; Wagner, G.R. The Future of Research on Work, Safety, Health and Wellbeing: A Guiding Conceptual Framework. *Soc Sci Med* **2021**, *269*, 113593, doi:10.1016/j.socscimed.2020.113593.
6. Total Worker Health | NIOSH | CDC Available online: https://www.cdc.gov/niosh/twh/default.html (accessed on 18 December 2023).
7. Yazdani, A.; Wells, R. Barriers for Implementation of Successful Change to Prevent Musculoskeletal Disorders and How to Systematically Address Them. *Applied Ergonomics* **2018**, *73*, 122–140, doi:10.1016/j.apergo.2018.05.004.
8. Dul, J.; Bruder, R.; Buckle, P.; Carayon, P.; Falzon, P.; Marras, W.S.; Wilson, J.R.; van der Doelen, B. A Strategy for Human Factors/Ergonomics: Developing the Discipline and Profession. *Ergonomics* **2012**, *55*, 377–395, doi:10.1080/00140139.2012.661087.
9. Kleiner, B.M. Macroergonomics: Work System Analysis and Design. *Hum Factors* **2008**, *50*, 461–467, doi:10.1518/001872008X288501.
10. Silverstein, M. Ergonomics and Regulatory Politics: The Washington State Case. *American Journal of Industrial Medicine* **2007**, *50*, 391–401, doi:10.1002/ajim.20437.
11. Becker, G.S. Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education, Third Edition.; The University of Chicago Press, 1994; ISBN 0-226-04119-0.

12. Sweetland, S.R. Human Capital Theory: Foundations of a Field of Inquiry. *Review of Educational Research* **1996**, *66*, 341–359, doi:10.3102/00346543066003341.
13. Nafukho, F.M.; Hairston, N.; Brooks, K. Human Capital Theory: Implications for Human Resource Development. *Human Resource Development International* **2004**, *7*, 545–551, doi:10.1080/1367886042000299843.
14. Hughes, C. *Diversity Intelligence: Reimagining and Changing Perspectives*; 2nd ed.; Palgrave Macmillan Cham, 2023; ISBN 978-3-031-33249-4.
15. Young Workers' Health and Safety Avaliable Online: https://lohp.berkeley.edu/young-workers/ (accessed on 12 December 2023).
16. Hidi, S.; Harackiewicz, J.M. Motivating the Academically Unmotivated: A Critical Issue for the 21st Century. *Review of Educational Research* **2000**, *70*, 151–179, doi:10.3102/00346543070002151.
17. Hidi, S.; Renninger, K.A. The Four-Phase Model of Interest Development. *Educational Psychologist* **2006**, *41*, 111–127, doi:10.1207/s15326985ep4102_4.
18. Lang, J.M. *Distracted: Why Students Can't Focus and What You Can Do about It*; First edition.; Basic Books: New York, NY, 2020; ISBN 978-1-5416-9980-9.
19. Mezirow J Transformative Learning Theory. In *Transformative learning in practice: Insights from community, workplace, and higher education*; J. Mezirow, E. W. Taylor, Eds.; John Wiley & Sons., 2009; pp. 18–29.
20. Van Schalkwyk, S.C.; Hafler, J.; Brewer, T.F.; Maley, M.A.; Margolis, C.; McNamee, L.; Meyer, I.; Peluso, M.J.; Schmutz, A.M.; Spak, J.M.; et al. Transformative Learning as Pedagogy for the Health Professions: A Scoping Review. *Medical Education* **2019**, *53*, 547–558, doi:10.1111/medu.13804.
21. Christie, M.; Carey, M.; Robertson, A.; Grainger, P. Putting Transformative Learning Theory into Practice. *Australian Journal of Adult Learning* **2020**, *55*, 9–30, doi:10.3316/ielapa.069076554869878.
22. Chan Yuen Fook; Gurnam Kaur Sidhu Promoting Transformative Learning through Formative Assessment in Higher Education. *AJTLHE: ASEAN Journal of Teaching and Learning in Higher Education* **2013**, *5*, 1–11.
23. UMass Lowell; CPH-NEW Healthy Workplace Participatory Program Available online: https://www.uml.edu/research/cph-new/healthy-work-participatory-program/ (accessed on 7 October 2021).
24. EIM On Campus. Avaliable online: https://www.exerciseismedicine.org/eim-in-action/eim-on-campus/, https://www.exerciseismedicine.org/eim-in-action/eim-on-campus/ (accessed 12 December 2023).
25. In a Year's Work™ | Center for Healthy Work | University of Illinois Chicago Available online: https://healthywork.uic.edu/in-a-years-work/ (accessed on 18 December 2023).
26. *California Code of Regulations, Title 8, Section 3395. Heat Illness Prevention in Outdoor Places of Employment.*
27. American College of Sports Medicine; Armstrong, L.E.; Casa, D.J.; Millard-Stafford, M.; Moran, D.S.; Pyne, S.W.; Roberts, W.O. American College of Sports Medicine Position Stand. Exertional Heat Illness during Training and Competition. *Med Sci Sports Exerc* **2007**, *39*, 556–572, doi:10.1249/MSS.0b013e31802fa199.
28. McDermott, B.P.; Anderson, S.A.; Armstrong, L.E.; Casa, D.J.; Cheuvront, S.N.; Cooper, L.; Kenney, W.L.; O'Connor, F.G.; Roberts, W.O. National Athletic Trainers' Association Position Statement: Fluid Replacement for the Physically Active. *Journal of Athletic Training* **2017**, *52*, 877–895, doi:10.4085/1062-6050-52.9.02.
29. Yeager, K.A.; Bauer-Wu, S. Cultural Humility: Essential Foundation for Clinical Researchers. *Applied Nursing Research* **2013**, *26*, 251–256, doi:10.1016/j.apnr.2013.06.008.
30. Daywalt, D.; Jeffers, O. *The Day the Crayons Quit*; Philomel Books: New York, NY, 2013; ISBN 978-0-399-25537-3.
31. Hughes, R.L.; Ginnett, R.C.; Curphy, G.J. *Leadership: Enhancing the Lessons of Experience*; Tenth edition.; McGraw Hill Education: New York, 2022; ISBN 978-1-260-68297-7.
32. Stark, A The Second Year of the Pandemic Ushers in New Trends, Enduring Topics in SIOP's 9th Annual Top 10 Work Trends List. Available online: https://www.siop.org/Research-Publications/Items-of-Interest/ArtMID/19366/ArticleID/5572/The-Second-Year-of-the-Pandemic-Ushers-in-New-Trends-Enduring-Topics-in-SIOP%E2%80%99s-9th-Annual-Top-10-Work-Trends-List (accessed on 18 December 2023).
33. Pollitz, K.; Published, M.R. Trends in Workplace Wellness Programs and Evolving Federal Standards. *KFF* 2020.
34. PricewaterhouseCoopers 2021 Health and Well-Being Touchstone Survey Available online: https://www.pwc.com/us/en/services/consulting/business-transformation/library/touchstone-survey.html (accessed on 18 December 2023).
35. Meister, J. The Future Of Work Is Employee Well-Being Available online: https://www.forbes.com/sites/jeannemeister/2021/08/04/the-future-of-work-is-worker-well-being/ (accessed on 18 December 2023).
36. Barton, M.A.; Kahn, B.; Maitlis, S.; Sutcliffe, K.M. Stop Framing Wellness Programs Around Self-Care. *Harvard Business Review*. April 4 2022.
37. *LinkedIn Learning Training Modules: How to Support Your Employees' Well-Being*; 2021;

38. Ericson-Lidman, E.; Strandberg, G. Burnout: Co-Workers' Perceptions of Signs Preceding Workmates' Burnout. *J Adv Nurs* **2007**, *60*, 199–208, doi:10.1111/j.1365-2648.2007.04399.x.
39. Barber, L.K.; Santuzzi, A.M. Please Respond ASAP: Workplace Telepressure and Employee Recovery. *Journal of Occupational Health Psychology* **2015**, *20*, 172–189, doi:10.1037/a0038278.
40. Workplace Mental Health & Well-Being — Current Priorities of the U.S. Surgeon General Available online: https://www.hhs.gov/surgeongeneral/priorities/workplace-well-being/index.html (accessed on 30 March 2023).
41. Harris, M.M. *The Business Case for Employee Health and Wellness Programs*; Society for Industrial and Organizational Psychology, 2016.
42. Boyer, Ernest L. *Scholarship Reconsidered: Priorities of the Professoriate*; The Carnegie Foundation for the Advancement of Teaching, 1990.
43. Moser, D.; Ream, T.C. Scholarship Reconsidered: Past, Present, and Future. *About Campus* **2015**, *20*, 20–24, doi:10.1002/abc.21181.
44. American Psychlogical Association Workers Appreciate and Seek Mental Health Support in the Workplace Available online: https://www.apa.org/pubs/reports/work-well-being/2022-mental-health-support (accessed on 18 December 2023).
45. Harter, J. Leaders: Ignore Employee Wellbeing At Your Own Risk Available online: https://www.gallup.com/workplace/507974/leaders-ignore-employee-wellbeing-own-risk.aspx (accessed on 18 December 2023).
46. Keisler-Starkey, K.; Bunch, L.N. *Health Insurance Coverage in the United States: 2021*; U.S. Census Bureau, 2022.
47. Scofield, D.E.; Kardouni, J.R. The Tactical Athlete: A Product of 21st Century Strength and Conditioning. *Strength & Conditioning Journal* **2015**, *37*, 2, doi:10.1519/SSC.0000000000000149.
48. What Can You Do with an Exercise Science Degree? - Arnold School of Public Health | University of South Carolina Available online: https://sc.edu/study/colleges_schools/public_health/study/undergraduate_degrees/exercise_science_bs/exsc_careers/index.php (accessed on 14 November 2023).
49. Occupational Safety and Health Administration *OSH Act of 1970*;
50. Extramural Workforce Development: Education & Research Centers Portfolio | NIOSH | CDC Available online: https://www.cdc.gov/niosh/oep/ercportfolio.html (accessed on 4 December 2023).
51. Centers of Excellence for Total Worker Health® | NIOSH | CDC Available online: https://www.cdc.gov/niosh/oep/twhcenters.html (accessed on 4 December 2023).
52. MSc Technology, Work, and Health at KTH Royal Institute of Technology. Available online: https://www.kth.se/en/studies/master/technology-work-health (accessed on 3 January 2024).