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'Higher' education: Incorporating cannabis as interdisciplinary curricula

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Introduction, Statement of purpose and objectives

Twenty - three U.S. states have legalized *cannabis sativa* (marijuana) for medicinal use or recreational adult use (Reuters, 2023, June 1). However, a diverse array of traditional students and returning adult learners who wish to pursue cannabis-related knowledge and acumen have relatively few options when it comes to pursuing advanced education in the field; let alone that which incorporates interdisciplinary studies (See Appendix 1, *U.S. Cannabis Curricula at 84 identified colleges/universities*). The availability of cannabis-centered academics for regional students lags in comparison to general student interest in the topic (e.g., Weissman, 2021); rapid growth and lofty projections for the ‘cannabis industry’ (e.g., Gibson, 2022); a correspondingly high demand for qualified ‘human capital’ (e.g., Doussard, 2017); a call for ‘risk aversion techniques’ (e.g., Buller et al., 2019); and, importantly, proverbial screams for actual ‘social justice’ and real social equity (e.g., Adinoff & Reiman, 2019; see also Orenstein, 2020). So, the foci of this paper and the novel interdisciplinary curriculum in cannabis is three-fold: student-centered, industry-centered, and community-centered.

A review of Appendix 1 demonstrates only a minority of universities in the U.S. – or one percent of approximately 6,000, in total - have incorporated cannabis as curriculum. Less than a handful of available cannabis curricula and credentialing in the U.S. have been cultivated via the theory of interdisciplinary study to address historical and systemic inequities and social justice angles. This is unfortunate, when one considers that, “the reality of the ‘War on Drugs’ was the widespread repression of racialized peoples” (Ghelani, 2020, p. 7).

A void of interdisciplinary curricula on the topic of cannabis is problematic for students who wish to pursue a meaningful and impactful career in the cannabis industry or ancillary industries. Cannabis’ presence in a legal market requires students understand not only important social justice and social equity considerations, but also important techniques related to risk aversion, community relations, health and wellness, customer service (Brown et al., 2020; Buller et al., 2019; Haug et al, 2016), hospitality-infusions, tourism motivations (Belhassen et al., 2007; Dupej & Nepal, 2021), and other facets underlying the potential for economic development via cannabis as a ‘place amenity’ (Doussard, 2017). The legal cannabis industry has a dire need for real social equity to remediate past harms done to disadvantaged minority communities in nearly every U.S. jurisdiction (Adinoff & Reiman, 2019; Orenstein, 2020).

With respect to this project’s community-centered focus, if cannabis is not addressed at the highest levels of curricula in higher education (due to ‘administrative apathy’ or otherwise) undesirable outcomes are more likely to come to fruition in the realm of community health and safety (Hicks et al., 2020). This may even include damaging those communities for whom cannabis reform was supposed to represent a significant benefit (Orenstein, 2020). Much like the responsibility - or a lack thereof - which goes along with alcohol service; for cannabis, the stakes could be even higher (Buller et al., 2019). There are recent studies which reveal cannabis may have a host of positive benefits associated with responsible adult usage (Acuff et al., 2022; Alshaarawy, & Anthony, 2019; YorkWilliams et al., 2019).

Background of the Project

A minority of academic institutions have offered credentialing in cannabis (Appendix 1; see also Jackson, 2022). In designing this curriculum aimed at addressing some of the most pressing issues, it also seems essential to consider the current demographics of cannabis in the

U.S., including public support and relevant economic projections. As of late 2020, 94% of U.S. states had either legalized cannabis for medicinal use or recreational adult use (Hicks et al., 2020). Since Colorado and Washington became the first states to pass legislation in 2012, there are now 24 states (plus the District of Columbia) that have legalized the recreational use of cannabis as of February 2024 (Chapekis and Shah, 2024).

By 2025, the U.S. cannabis industry is projected to reach \$43 billion in sales (NORML, 2021) and estimated to employ more than a half million workers in the U.S. by 2025, if not sooner (Jackson, 2022). Available positions in the industry are widespread and wages in the industry may range from \$15/hour to \$150,000/annually (Jackson, 2022; Weissman, 2021).

The purpose of this project was to create interdisciplinary, stackable credentialing (badge, certificate, and academic minor) in *cannabis operations* at a Midwest university, which is one of the first of its kind in the U.S. This credentialing is intentionally constructed to be student-centered, industry-centered, and community-centered. Relying upon the wisdom of existing research and prevailing market conditions, the curriculum consists of new and existing cannabis-based courses, as well as an interdisciplinary menu of relevant, existing non-cannabis curriculum. These include courses in sociology, criminal justice, social justice, community health and social work, community and infrastructure planning, non-profit administration, hospitality law, and others (See Table 1, *Condensed Description of Program*). Such courses are important for viewing cannabis from a holistic perspective; or as Ghelani (2020) describes:

For over a century, government actors, corporate interests, and xenophobic impulses have stigmatized cannabis users while shaping public perceptions around this drug . . . Under the pretexts of public safety, morale hygiene, and health promotion, state actors have contributed to manufactured fears associated with cannabis . . . Homogenous narratives defining racially marginalized cannabis users as aggressive, unpredictable criminals were produced to justify state-sanctioned management through police profiling, incarceration, treatment, and supervision . . . (and) the laws and norms around substance use were essentially established to control minority communities (p. 6).

This curriculum is designed to provide instruction on best practices for consumer safety, risk aversion techniques, environmental justice, social justice, social equity, and fiscal responsibility in the cannabis industry. While this project involved the creation of interdisciplinary credentialing in '*Cannabis Operations*,' it does not address other important curricular topics discussed in available research. The curriculum within this innovation will assist students in exploring the interrelation between important cannabis-based issues and the fields of sociology, criminal justice, social justice, community health and social work, community and infrastructure planning, non-profit administration, hospitality law, and others.

There is a significant gap in the research pertaining to whether an increased curricular and industry presence may actually reverse issues with student persistence, retention, graduation rates, and a resultant inability to secure employment following graduation (Acuff et al., 2022; Alshaarawy & Anthony, 2019; Kensinger, 2015; YorkWilliams et al., 2019). Like alcohol, marijuana has a host of negative outcomes currently associated with use (Palmer et al., 2012). However, unlike alcohol, marijuana can provide a significant medical benefit to those students who may have chronic and debilitating ailments (Kensinger, 2015; Sausen, 2017). As such, universities should also consider action research or the formation of task forces to discuss how to

best accommodate its use for medicinal purposes by students with disabilities, if able (Sausen, 2017).

Literature Review

Interdisciplinary credentialing in cannabis, constitutes a novel curricular approach. It seeks to cater to interested students who have a common interest in cannabis (as a topic of study), but who also come from diverse belief sets, backgrounds, and communities. Overall, this interdisciplinary curriculum also seeks to combine the ‘best’ of the hospitality industry (Dupej & Nepal, 2021), while seeking to avoid the ‘worst’ of the harms caused to our communities by the alcohol and tobacco industries (Orenstein, 2020), and the criminal justice system (Adinoff & Reiman, 2019). Unfortunately, instructive articles on the creation of such curricula, or research pertaining to student demand for these curricula, are rarely addressed by available historical or modern academic research (Adinoff & Reiman, 2019; Brown et al., 2020; Earnest, 2018; Joffray & Johnson, 2021; LeVert, 2018; Putnam et al., 2019). As noted by Adinoff and Reiman (2019), “[g]iven the limited time frame of adult-use cannabis legalization, jurisdictional variability in cannabis laws, a relative absence of government funding, . . . and a rapidly changing political and legal landscape, peer reviewed manuscripts are in short supply” (pps. 674-675).

Interdisciplinary curricular scaffolding in cannabis could account for geo-political forces by region (Doussard, 2017), political leanings of university administration (Wardell, 2017), the ever-increasing presence of cannabis in higher education and modern society (Blumberg, 2018; Campion, 2018; Ferguson, 2017; Gray, 2017), and the support cannabis has generated from both college students and the general public (Weisman, 2021). While cannabis has experienced rapid growth, it is not without risk (Buller et al., 2019). Instead, it seems necessary to account for risk aversion techniques through interdisciplinary education which also explores its tumultuous history and promising future (Earnest, 2018).

It is essential to synthesize outcomes of the available literature and seek common themes or areas pertaining to this project inquiry. It seems properly developed cannabis-based curricula should: (1) enhance levels of student awareness and wellness (Putnam et al., 2020); and, (2) be used as a conduit for professional training in (a) the cannabis industry (Haug et al., 2016); (b) tangential industry clusters (Brown et al., 2020); and, (c) ancillary industries, like hospitality (Dupej & Nepal, 2021), industrial (Velluzzi, 2010); and medical service sectors (Caligiuri et al., 2018; Hicks et al., 2020). Much like issues with student wellness (Valenti, 2017), additional cannabis-based curricula should also help combat – or, more appropriately, mitigate - the role of various forms of industrial (Brown et al., 2020) and societal risk (Adinoff & Reiman, 2019; Buller et al., 2019). A lack of consideration for the above issues may clearly be detrimental to student development (personally and vocationally); sustainable and equitable growth and development of the cannabis industry (Orenstein, 2020); and the growth of other reliant benefactors and stakeholders (Crookston & Hooks, 2012; Hicks et al., 2020), including institutions of higher education.

Available research reveals interdisciplinary curricula should consist of implementing proactive, best practices; which are reasonably aimed at ‘risk aversion’ (i.e., parent/youth education, impaired operation of vehicles, workplace safety) and the development of programs which are: (i) socially just, (ii) fiscally responsible, and (iii) environmentally just, in terms of cannabis operations and community engagement strategies (Buller et al., 2019; Orenstein, 2020).

Velluzzi's (2010) research, while focused on viticulture, demonstrates the most effective form of cannabis-based studies may be one which provides participants with not only interdisciplinary education, but also the opportunity to engage in experiential learning via industry-based internships. So, these curricula also include an experiential component, to provide learners with access to the industry and governing bodies of impacted municipalities and relevant non-profit agencies. Overall, we must help students become professionals who seek to improve community perceptions of, and relations with, cannabis businesses and who seek to prevent harm to others (Brown et al., 2020; see also Buller et al, 2019; Doussard, 2017; Orenstein, 2020).

Student-Centered Issues: Laws, Politics, & Curricular Philosophy

There are a number of student-centered issues to consider with cannabis (LeVert, 2018). It is important to consider the role and impact government regulations, geography, and socio- and geo-political forces have had in the development of such curriculum (Doussard, 2017). Many of cannabis-centered programs have seemingly come into existence: (a) in U.S. states which have legalized cannabis for 'adult-use;' (b) to further expand the body of practical, horticultural, medical, legal, and/or business/consumer knowledge; and, (c) to meet the anticipated demand for cannabis-related knowledge in various vocations within, or tangential to, the cannabis industry (Doussard, 2017; Ferguson, 2017; Gray, 2017).

The U.S.'s federal prohibition on cannabis - and the plant's tumultuous history; caused, in part, by its 'Schedule I' classification - are thought to be primarily responsible for any current reluctance on the part of academic leadership to incorporate cannabis as curricula (Custer, 2018; Wardell, 2017). It certainly is not a case of a lack of economic impact (Weisman, 2021). Rather, this reluctance is primarily due to conservative internal politics and/or the threat of federal funds being withdrawn or withheld due to non-compliance with marijuana's intersection with the Drug Free Workplace Act (DFWA) and the Drug Free Schools & Communities Act (DFSCA) (Custer, 2018; Kensinger, 2015; Valenti, 2017). Essentially, and as also described by Wardell (2017), by virtue of the fact these institutions receive federal grant money, they may be subject to perceived or real federal sanctions (reduction/loss of grants) and/or increased levels of stakeholder scrutiny for such curricular offerings (from alumni, donors, faculty, and others) (see also Custer, 2018).

Industry-Centered Issues: Cannabis and Human Capital

Despite being unique as compared to other consumption-based commodities (Droussard, 2017), legal cannabis has faced or will face many of the same obstacles encountered by providers of these other commodities (i.e., restaurants, bars, etc.), as described by Buller et al. (2019) and Orenstein (2020). In particular, and especially in and after the Covid-19 era, one must consider the demand for human capital versus the available supply of qualified (and motivated) workers (Bouchard et al., 2009; Droussard, 2017). So, to determine whether a recommendation for increased curricular offerings is well-founded, it is also important to examine whether the cannabis industry has a 'need' for the type of skill set one may gain from post-secondary education (Taylor, 2016). Any reasonable university administrator might likely contend this a condition precedent for the establishment of any curriculum.

Employment projections for the cannabis industry are extremely high (Buller et al., 2019). Likewise, projections for the laboratory analysis industry and marketing industry - particularly marijuana packaging products- are extremely high (Gray, 2017; Guion, 2018; NMU,

2021). Most important, from a public health standpoint, medical professionals are now also expected to be knowledgeable about cannabis - or marijuana's dual role as a medication used to treat a host of conditions (Caligiuri et al., 2012; Earnest, 2018; Hicks et al., 2020; Joffray & Johnson, 2021). Examples of medical use include treating chronic pain and opioid use (Beasley & Dundas, 2024), treating epilepsy, alleviating nausea and vomiting, and treating anorexia (Mayo Clinic Staff, 2024).

The interview responses in Taylor (2016), provide insight into the varying challenges of running a viable cannabis-oriented business from the following perspectives: (1) managing industry regulation; (2) maintaining a competitive advantage; (3) staffing and training; (4) safety and security; (5) marketing; and, (6) support from local communities. Summarily these findings, in tandem with those from Belhassen et al. (2007); Bouchard et al. (2009); Brown et al. (2020); Earnest, (2018); Haug et al. (2016); Hicks et al. (2020); and, Orenstein (2020) - provide clarity into the relationship between communities and cannabis, but also shed light on topics for which there is a need for additional curricula and training.

Community-Centered Issues

While some argue it is simply a 'harmless plant,' cannabis is nevertheless a 'drug' (a regulated substance with psychoactive properties) and its presence in the legal marketplace carries a variety of risk factors (Orenstein, 2020). Cannabis can impair a user, leading to individual harm or harm to third parties (Buller et al., 2019). It is thought that if both human capital and consumers have confidence (or 'pride') in their knowledge of the benefits and drawbacks of cannabis, they are more likely to be 'safer' during periods of provision to third parties (e.g., not providing to minors or visibly intoxicated persons) or during personal use (e.g., avoiding abuse, overconsumption, operating vehicles), as per Buller et al. (2019). Orenstein (2020) calls for impactful social equity programs and states:

These programs justifiably seek to remediate past harms, but careful planning is essential to avoid a public health trap for the populations these programs seek to benefit. Legal guardrails to reduce the involvement of large corporate entities in equity programs and in the cannabis industry generally will make equity programs more effective and reduce the risk of unintended public health consequences (p. 69).

Adinoff & Reiman (2019) and Orenstein (2020) focus on the importance of social justice measures in the transition from an illicit to legal market for cannabis. Among other facets, Adinoff and Reiman (2019) and Orenstein (2020) explored whether regulatory reforms led to the creation and implementation of systems to assure equitable access to the cannabis industry. They also considered whether these reforms may lead to additional disproportionate, negative impacts in marginalized communities. While approaches to improving equity have been varied across the U.S., universal recommendations include using regulatory reforms to (a) encourage diversity, in the form of minority-owned cannabis businesses; and to, (b) provide avenues which facilitate integration of these businesses into the larger for-profit industry (Adinoff & Reiman, 2019).

One of the most significant strengths of developing curricula based on cannabis seems to be the novelty of the topic. In addition to preparing students for employment in the cannabis industry, regulatory reforms also present significant research opportunities for every major discipline. Combined with these opportunities, the presence of clearly explained 'risks' should

create a demand for ancillary service providers - like community colleges and other institutions of higher education (Crookston & Hooks, 2012) - to provide certification and training in areas tangential to the industry, as well (e.g., banking, insurance, law, social work).

Common findings and recommendations also suggest most states should be able to replicate the economic success other jurisdictions (like Colorado) have enjoyed since regulatory reform (Taylor, 2016). In other words, the opportunities of adding cannabis-based curricula can outweigh the potential challenges, *if* curricula contain courses designed not only to teach students about cultivation, processing, and sales of cannabis product, but are also designed to address customer service, hospitality, tourism, and other facets underlying the potential for economic development via additional amenities (restaurants, lodging, tours, boutique offerings, etc.) – as described by Dupej & Nepal (2021). These findings represent a significant strength of the studies, combined, in that they do assist in advancing the narrative of this review in a more ‘forward thinking’ way, and provide further justification for the creation of novel, relevant, and interdisciplinary curricula.

Development of a cannabis curricula

A problem articulated in this paper is a lack of advanced educational opportunities and credentialing for regional students in the field of cannabis; let alone ones which incorporate interdisciplinary studies (See Appendix 1). Velluzzi’s (2010) research demonstrates the most effective form of cannabis-based education may be one which provides participants with the opportunity to engage in experiential learning, via industry-based internships. Therefore, the overarching purpose of this curricula is to provide student-centered, industry-centered, and community-centered instruction on best practices for consumer safety, risk aversion techniques, environmental justice, social justice, social equity, and fiscal responsibility in the cannabis industry. These curricula will also include an experiential component, to provide learners with access to the industry and perhaps, governing bodies of impacted municipalities and relevant non-profit entities or ancillary businesses. Overall, the objective of this innovation is to design and implement ‘cannabis operations’ curricula at a Midwest University.

Project components

Like most institutions, the curricular process at the subject university is multi-layered and managed under the sphere of faculty governance. Curricular proposals and mapping are typically uploaded by faculty into an internal, online system. These proposals and corresponding documentation - like syllabi of record and curricular mapping - are subsequently vetted at department, college, dean, and university levels. It is important to incorporate relevant student learning objectives that contain long-term academic goals created by faculty that are measurable over time (neaToday, 2024). Amendments to a proposal, including those related to ‘student learning objectives’ may be requested by reviewers at any stage of the curricular approval process. Once a proposal has been amended (as appropriate) and debated within the University Curriculum Committee it is forwarded via a majority vote to the university provost for final approval. If approved, the proposal is effectuated via the university registrar and made available for student scheduling.

Stackable Credentialling

Consistent with other institutions of higher learning, the subject university offers baccalaureate, masters, and doctoral degrees in a variety of disciplines for degree-seeking students. Undergraduate students typically elect at least one major area of study and may also elect to seek multiple majors or academic minors from a diverse array of offerings. There are accelerated degree completion opportunities for returning adult learners and ‘micro-credentials,’ or stackable credentialing (badges and certificates), for both enrolled students and non-degree seeking learners from the broader community. Guidance via policy language for the development of stackable credentials within parameters is described in the subject university catalog:

Badge: A digital badge, or badge, is a record of achievement that recognizes a student's completion of a coherent and meaningful academic experience. A badge includes anywhere from 0.5 to 15 academic credits and may include additional noncredit criteria. Badges are digital credentials and are posted to academic transcripts.

Certificate: A certificate is a record of achievement that recognizes a student's completion of a coherent and meaningful academic experience. A certificate includes anywhere from 9 to 18 academic credits and is posted to the academic transcript.

Minor: A collection of courses generally consisting of a minimum of 20 semester hours of credit.

Hospitality & Tourism Management as Host to Interdisciplinary Cannabis Curricula

The subject university approved HTM 242 (*Cannabis Regulations and Tourism*) in 2019, becoming the first course in the U.S. to address the impacts of cannabis regulations on the hospitality and tourism industry. It also discusses a number of issues pertinent to other disciplines, including legal studies, criminal justice, sociology, supply chain management, human resource management, marketing, and/or public health. The popular course has historically attracted students from a variety of majors and academic disciplines. The course has since been offered in both traditional format (face-to-face) and in an asynchronous format, during both regular-length and accelerated semesters.

HTM 242 was an important first step in curricular conversations surrounding cannabis. These conversations included the proposition that tourism within a community requires a certain level of mutual respect on both the parts of hospitality providers and the communities which house such businesses (Dupej & Nepal, 2021). The essence of HTM 242 is to explore how cannabis has been (and will be) infused with nearly all subsegments of our communities and their corresponding hospitality industries including weddings, conferences, and event planning; lodging; culinary infusions; facility tours, community tours, or nature-based tours (Dupej & Nepal, 2021). Cannabis is more than a simple commodity exchanged at the point of sale within a brick-and-mortar retail space. Instead, like alcohol, it is a substance which very much provides an experience for consumers or impacts the experiences one has while pursuing other activities

in hospitality and leisure. HTM 242 also explores the specific impacts cannabis has on stakeholders, beyond hospitality and tourism providers, at large.

While there are many important offerings the subject university can provide in the field of cannabis, the curricula in cannabis operations includes SLO's that are intentionally and carefully considered to be hospitality-related and fit the ethos of the Hospitality and Tourism Management (HTM) program. The stackable credential SLO's are within the knowledge domain of the hospitality and tourism industry.

Relying upon the wisdom of existing research and prevailing market conditions (cited herein), the curriculum in cannabis operations blends new and existing cannabis-based courses (HTM 217, HTM 242, HTM 317) with an interdisciplinary menu of relevant, existing non-cannabis centered curriculum. Among others, these include courses in sociology (SOC 252), criminal justice (CJ 101/315), social justice (CJ 492), community and infrastructure planning/non-profit administration (PNH 209), and community health and social work (SW 150) (Ghelani, 2020; See Table 1, *Condensed Description of Program*). As explained below, while the badge proposal contains cannabis-specific courses, both the certificate and academic minor proposals house required experiential components and interdisciplinary electives.

Table 1. *Condensed Description of Program*

Micro - Credentials	Core Courses	Elective Courses
Badge in “Cannabis Operations”	HTM 217 (Cannabis and Culture) HTM 317 (Responsible Cannabis Operations) HTM 242 (Cannabis Regulations and Tourism)	None
Certificate in “Cannabis Operations and Community Planning”	Complete the Badge Requirements and HTM 390 (Field Internship)	Take one (1) of the following: CJ 101 (Introduction to Criminal Justice) SW 150 (Introduction to Social Work and Social Welfare) PNH 209 (Introduction to Urban and Regional Planning) SOC 252 (Sociology of Drug Use and Abuse)
Minor in “Cannabis Operations Management”	Complete the Certificate Requirements and HTM 490 (Field Experience)	Take one (1) of the following: PNH 220 (Organizing to Make a Difference) CJ 315 (Principles of Security) HTM 361 (Hospitality Law and Legislation) CJ 492 (Social Justice in the American Criminal Justice System)

Badge in Cannabis Operations

A badge in *Cannabis Operations* is the first sequence of an interdisciplinary, three-part, stackable credential (badge, certificate, and minor) concerning the topic of cannabis. The 9-credit badge consists of important hospitality and tourism learning objectives and competencies in three, 3-credit courses: *Cannabis & Culture* (HTM 217), *Cannabis Regulations and Tourism* (HTM 242), and *Responsible Cannabis Operations* (HTM 317). Students are not required to take

these courses in any specific order, which should facilitate individualized student experiences, academic interests, and ease of scheduling. Canna-curious students may take only one of the courses as an exploratory measure (or ‘free elective’) initially. Overall, the skill set, and knowledge provided via the badge portion of the stackable credentialing acclimates learners to the cultivation, processing, and sales of the cannabis product (Buller et al., 2019; Doussard, 2017) and other important ancillary impacts of cannabis (Dupej & Nepal, 2021; Orenstein, 2020), which will be reinforced in the latter stages of credentialing (should students seek those opportunities). Students must successfully complete each course (HTM 217, HTM 242, and HTM 317) to fulfill the requirements of the badge in *Cannabis Operations*.

Like HTM 242, the two new courses on cannabis in these curricula (HTM 217/HTM 317) have also been carefully planned. HTM 217 (*Cannabis & Culture*) is a course which addresses the cultural, psychosocial, and social justice components of cannabis (Ghelani, 2020; Orenstein, 2020). It focuses on cannabis’ role in historical and modern culture, provide an introduction to public policy and drug use, and address contemporary moral problems posed by cannabis, ethnobotany, environmental issues, sustainability, and others (Ghelani, 2020). HTM 317 (*Responsible Cannabis Operations*) is a course parallel to an existing course in the Hospitality & Tourism Management program (HTM 318: *Responsible Beverage Management*). This new course (HTM 317) focuses on the responsibilities and demands made of the contemporary cannabis retail manager and best practices to address them (Taylor et al., 2016). It includes content focusing on product knowledge, cultivation, and supply chain management (i.e., seed-to-sale tracking), controls and operations, human resource management, social concerns (including health-based recommendations made by employees), and responsible product service (Buller et al, 2019).

Certificate in Cannabis Operations & Community Planning

The 15-credit certificate in *Cannabis Operations and Community Planning* consists of the 9-credit badge and additional important hospitality and tourism learning objectives/competencies in “*Customer Satisfaction in the Hospitality Industry*” (HTM 117; and an existing experiential course, entitled “*HTM Field Experience I.*” Consistent with prior content from the badge, the curriculum in the certificate also incorporates and reinforces important community planning concepts and relevant inter-disciplinary course electives in criminal justice, social work, public-non-profit-health administration, and sociology (Table 1, *Condensed Description of Program*). The certificate curricula are focused on encouraging learners who work (or aspire to work) in the cannabis industry, or ancillary industries like hospitality, tourism, public, non-profit, health administration, and others to critically think about the positive and negative impacts cannabis has on various stakeholders within our local communities and broader society, at large.

The concept of cannabis’ impact on ‘community’ is covered either explicitly or implicitly in all the courses for these stackable credentials. Within the certificate, HTM 117 focuses on the ‘experience’ of the consumers within the community when purchasing services or commodities. Experiential learning in the cannabis industry via the internship requirement, allows students to engage in community-based learning, in that they are involved in creating materials which will be shared with the community or interacting with community members, firsthand (Velluzzi, 2010). Lastly, each of the elective choices, address broader, important topics in the context of cannabis history and future. Both the criminal justice, social work, and sociology options focus on the impacts cannabis can have on addiction, mental health, and well-being (Ghelani, 2020). The public and non-profit course (PNH 202) permits students to focus on the logistics of

implementing a service or commodity into local communities, with the intent of maximizing positive impacts and minimizing negative ones (zoning regulations, for example). Overall, each of the components of this certificate reinforces content from the badge, and content which can be studied even further via the academic minor as the final sequence of this stackable credentialing.

Minor in Cannabis Operations Management

It seems one hallmark of a university experience is the ability for students to elect an academic major(s) and academic minor(s). The 20-credit minor in *Cannabis Operations Management* incorporates the student learning outcomes from the previous 15 credits, with additional important hospitality and tourism learning objectives/competencies in HTM 390 (*Field Experience II*) or HTM 490 (*Senior Internship*), and relevant inter-disciplinary course electives in criminal justice; hospitality and tourism management; and public, non-profit, and health administration. The upper-level electives for the minor provide students with an opportunity to think even more deeply about the role of cannabis in our communities and how to implement best practices in restorative justice, legal conformance, peaceful protest, the formation of community-focused organizations, maintaining security, and measuring other public impacts, moving forward (Table 1). Likewise, students who pursue a minor in *Cannabis Operations Management* will also engage in impactful, experiential learning via an internship which will require a greater level of interaction with community members than the certificate credential affords (Velluzzi, 2010).

While the badge and certificate are available to either degree seeking or non-degree seeking learners, the minor in *Cannabis Operations Management* is solely available for degree seeking students. Unlike the prior levels of credentialing, the minor permits in-person completion of curriculum (for those students who prefer face-to-face instruction). With cannabis being a ‘consumption-based commodity’ and a ‘place amenity’ (Droussard, 2017), service-based facets and subsectors of the cannabis industry (with a preference for workers with cannabis credentialing) present the potential for significant economic development and job creation, via offerings of additional amenities, like the vast array of related hospitality-cannabis infusions, as per Dupej and Nepal (2021) and others. In turn, this provides students with increased opportunities to secure employment and advance in their respective positions with organizations.

Discussion

All three levels of stackable credentialing in this project concern an overarching topic of cannabis operations and seek to provide current and future students with innovative, impactful, and experiential learning beyond that which is offered at other institutions (Appendix 1). In addition to direct measures of increased ‘visibility’ success will be ascertained and assessed via both primary, direct sources of knowledge (e.g., written assessment) and secondary, in-direct sources (i.e., employer surveys of work-experience components). These credentials seek to encourage critical thought about broader social issues than those considered in existing programs.

Overall, the academic minor reinforces the importance of prior content in the badge and certificate. For example, upon completion of the minor, students should understand the potential positive and negative impacts licensed and regulated members of the cannabis industry will have on our communities. Students should also appreciate that such impacts are inseparable from the

impacts which cannabis will have upon other important, ancillary industries and public services - such as hospitality and tourism management, public administration, social work, criminal justice, and sociology. This is especially so in light of the impacts those industries and services have historically had on the current need for cannabis reform (i.e., repairing social harms and inequities caused by the ‘War on Drugs’), as discussed by Ghelani (2020) and Orenstein (2020). Assessment of these important learning objectives will be conducted in a variety of ways, including student-to-student interaction (participation) and quizzes/examinations, but also via creative contributions (papers and presentations), and self-reflection (journals). The opportunity to pursue a minor in *Cannabis Operations Management* provides students with an additional, visible layer of expertise on their academic transcript.

Conclusion

Through the creation of an interdisciplinary minor and micro-credentials in cannabis operations, the subject university is fully capable of offering appropriate curricula to meet modern consumer or labor demands; while also helping to dispel harmful rumor, innuendo, and mis- or dis-information. Based on the available research, the creation of this stackable credentialing should increase the popularity and viability of the institution as a forward-looking institution; provide greater legitimacy to the cannabis industry; strengthen anticipated economic outcomes for all stakeholders; improve regulatory compliance; and provide a safer and more enjoyable experience, overall, for consumers.

In turn, cannabis-related industries should continue to mature via guidance of knowledgeable and well-qualified leadership. Above all, the subject university and concerned stakeholders can help ensure the cannabis industry - and the booming market for its products - remains well-regulated and safe for consumers. Via this design it is hoped this innovation will lead to improvements in both infrastructure in local communities and educational programs to accommodate this new, niche industry; as well as an improved community perceptions of, and relations with, cannabis businesses (Brown et al., 2020; see also Buller et al, 2019; Doussard, 2017; Dupej & Nepal, 2021; Ghelani, 2020; Orenstein, 2020).

As explained above, this curricular proposal was submitted to the shared governance system and vetted at departmental, college, and university curricular committee levels. Ultimately, the university decided to approve and move forward offering the three stackable credentials. Registration numbers for the first two academic years indicate many students have selected some of these courses. If approved for enrollment, each student should ideally meet with an advisor to chart a course through the curriculum which fits their individualized needs and circumstances.

Table 1 (*Condensed Description of Program*) presents a summary of the interdisciplinary three-part, stackable credentials (badge, certificate, and minor). These micro-credential courses (badge and certificate) are offered on-line, and courses used to pursue a minor, only, be either in-person or online. The primary target constituency are those who work (or aspire to work) in the retail cannabis industry. Both the badge and certificate would be available for both degree seeking and non-degree seeking individuals.

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Appendix 1 – U.S. Cannabis Curricula at 84 identified colleges/universities

<u>College/University</u>	<u>Cannabis Courses/Programs</u>
Alabama A&M	Research in Hemp Production
American International College	Masters in Cannabis Science and Commerce
Beal University	Associate Degree in Cannabis Business Administration
Cal Poly (Humboldt)	BA in Cannabis Studies
Castleton university	Cannabis Studies Certificate Program
Central New Mexico CC	Cannabis Establishment Technician Certificate Course
City College of San Francisco	Cannabis Associate of Arts Degree
Clark University	Graduate certificate: “regulatory affairs for cannabis control”
Coast Mountain College	Certificate in Cannabis Cultivation
Colorado State University	BS in Cannabis Biology & Chemistry
Community College of Denver	Associate of Applied Sciences degree in Cannabis Service
Cornell University	Cannabis: Biology, Society, and Industry
Dalhousie University	Cannabis Production & Management Course
Delaware Valley University	Cannabis Certificates
East Stroudsburg University	Medical Marijuana and Public Health Certificate
Eastern Gateway CC	Associate degree in Management Cannabis
Excelsior College	Graduate Certificate in Cannabis Control
Farmingdale State College	Cannabis Production and Management Certificate
Florida A&M	Medical Marijuana Program
Florida Atlantic University	Certificates in Cannabis
Florida Guld Coast University	Cannabis Professional Certificate
Gateway Community College	Budtender Training, Cannabis 101, and Hemp Education
Grand Valley State University	Stackable credentials in cannabis operations
Harper College	Cannabis Science and Therapeutics Certificate
Harrisburg Area CC	Green Flower
Harvard University	Cannabis Policy & Law, and Cannabis Business
Holyoke Community College	Cannabis Cultivation
Illinois Valley Community College	Cannabis Production Certificate
Johnson and Wales University	BS in Cannabis Entrepreneurship
Kalamazoo Valley CC	Green Flower
Kiswaukee College	Associate degree in Cannabis Horticulture
Lackawanna College	Cannabis Professional Certificate
Lake Superior State College	Bachelor of Science in Cannabis Business
LIM College	BBA in Business of Cannabis
Little Priest Tribal College	Associate degree in Cannabis Studies
Long Beach City College	Introduction to the Cannabis Industry
Louisiana State University	Careers in Cannabis
Maryland University of Health	Post Baccalaureate Certificate in Cannabis Science
Metropolitan State Univ law	Several cannabis related courses in health, science, and law

Minot University	Major: Medicinal Plant Extraction
Mount Aloysious College	Green Flower
Naugatuck Valley CC	Applied science in cannabis horticulture
Niagara County CC	Number of classes in cannabis horticulture
North Carolina A&T	Industrial hemp program
Northern Michigan University	Major: Medicinal Plant Chemistry; Certificate Green Flower
Northern New Mexico University	Cannabis Establishment Technician
Northwest Missouri State University	Green Flower
Oakton Community College	Cannabis Transportation, Logistics & Supply Chain Management
Oregon State University	Marijuana Policy in the 21 st Century
Pacific College of Health & Science	Master of Science in Medical Cannabis Therapeutics
Pennsylvania Institute of Technology	Associate Degree in Cannabis Business
Prairie State University	Certificates in Cannabis Vendor Compliance
Raritan Valley Community College	Online cannabis dispensary training course
Rider University	Cannabis Studies Certificate
Rowan University	MBA in Cannabis Commercialization
Rutgers University	Hemp and Medical Cannabis
St. Joseph's University	Green Flower
St. Louis University	Cannabis Science and Operations Certificate
Scottsdale CC	Introduction to the Cannabis Industry
Seattle Central College	Cannabis Institute
Southern Illinois College	Associate Degree in Cannabis Horticulture
Southern University	Medical cannabis program
Stockton University	Cannabis Studies; minor in social justice and cannabis
SUNY (Morrisville)	Cannabis Studies Minor
Syracuse University	Green Flower
The Ohio State University	Marijuana Law, Policy, & Reform
Thomas Jefferson University	Certificate program in Cannabis Science
Tulsa Community College	Green Flower
Tuskegee University	Research in Hemp Production
University of Arizona	Business of Cannabis, Cannabis Law & Policy, Cannabis Healthcare
University of California (UCLA)	Cannabis Research Initiative
University of California (Davis) Center	Physiology of Cannabis / Cannabis & Hemp Research
University of Colorado	Cannabis Entrepreneurship Academy (4 day program)
University of Connecticut	Horticulture of Cannabis
University of Denver	Cannabis Policy & Law; Business of Marijuana; Cannabis Journalism
University of Illinois	Cannabis Production & Management Certificate
University of Maine	Introduction to Cannabis Cultivation and Science course
University of Maryland	Medical Cannabis Science

University of Michigan	PharmSci 420
University of Mississippi	The Marijuana Project
University of Nevada (Reno)	Green Flower
University of New Mexico	Medical Cannabis Research Fund
University of New York (Morrisville)	Cannabis Studies: Horticulture
University of Rhode Island	Cannabis Studies Certificate
University of San Diego	Green Flower & Center for Medicinal Cannabis Studies
University of Sciences (Philly)	MBA Program
Utah State University	Free course on the Science of Medical Cannabis Cultivation
University of Vermont	Cannabis Science & Medicine
University of Washington	Medicinal Cannabis & Chronic Pain
University of Wisconsin	Green Flower
Vanderbilt University	Marijuana Law and Policy
Western Illinois University	Cannabis Production minor
Western Washington University	Cannabis Certificate Program
York College of Pennsylvania	BS in Cannabinoid Chemistry