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Assessments of Dual Degree Programs at University of Kentucky College of Pharmacy

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Acknowledgments

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Executive Summary

Information about dual degree programs offered by colleges and schools of pharmacy is scarce. Factors that motivate a pharmacy student to pursue a dual degree have not been formally assessed. Furthermore, whether dual degree graduates pursue non-traditional career paths more often than single degree graduates (i.e. PharmD degree alone) is unknown. The research questions are: 1.) Why do PharmD students pursue dual degree programs at the University of Kentucky College of Pharmacy? and 2.) Does obtaining a dual degree increase the likelihood of a "non-traditional" pharmacy jobs upon graduation?

There are three main parts of this capstone project. The first part of this project is composed of descriptive analyses of reasons that motivate first year pharmacy students (PY1) at the University of Kentucky College of Pharmacy (UKCOP) to pursue a dual degree. The second part of this project is to assess current second through fourth year dual degree pharmacy students (PY2-PY4) opinions of dual degree programs offered at the University of Kentucky College of Pharmacy. The first and second parts of this project will be assessed using survey questions. The third part of the project examines the career paths of existing University of Kentucky College of Pharmacy graduates, using logistic regression.

There was an 81.8% response rate for first year pharmacy students (PY1) and a 73.7% response rate for dual degree students (PY2-PY4) surveyed. Approximately 66% of PY1 students did not want to pursue a dual degree. More than 66% of PY1 students believed obtaining a dual degree will lead to a higher chance of advancing in their career. The majority of dual degree students (40%) stated that they chose their respective dual degree program to differentiate themselves from pharmacy peers and become more marketable .The next reason for pursuing a dual degree was that students could obtain a second degree and not pay extra tuition, in essence a "free degree" (20%).

Approximately 16% of PY1 students want to pursue "non-traditional" pharmacy career verses 36% of dual degree students who want to pursue a "non-traditional" pharmacy career. The odds ratio between 2010 vs. 2009 University of Kentucky College of Pharmacy graduates was significant. Student who graduate in 2010 are 2.269 times more likely to have a "non-traditional" job than those who graduate in 2009. The likelihood of obtaining a non-traditional pharmacy career if you had a "dual degree" was very close to significant.

Faculty and professors to pharmacy students throughout their education should heavily emphasize career advice. Information about possible non-traditional pharmacy careers can influence graduates to be open-minded to alternative career paths.

Introduction

Background

For over 20 years joint degree (dual degree) programs have been offered at medical and nursing schools.[1] Several medical colleges combine other degree programs with the medical degree, for example the Master of Business Administration (MBA) and PhD. [1] Schools of nursing have seen the approval of joint degree programs in medicine and have followed suit. One of the common joint degree programs is combining the Master of Science in Nursing (MSN) with the MBA.

However, information about dual degree programs offered for colleges and schools of pharmacy is scarce. According to American Association of Colleges of Pharmacy (AACP) as of 2011 there are 64 Colleges and Schools of Pharmacy expected to offer at least one dual degree program[2]. Dual degree programs in pharmacy combine the doctor of pharmacy degree with such degrees as master of public health (MPH), master of business administration (MBA), master of public administration (MPA), master of science (MS), masters of science in physician assistant studies (MSPAS), juris doctor (JD), and doctor of philosophy (PhD). Future pharmacists are seeking additional skill sets to differentiate themselves from their colleagues. Dual degree programs offer a time-efficient mechanism for pharmacy students to enhance their educational pursuits.[1] The AACP states that approximately 35 (29.4%) Colleges and Schools of Pharmacy offer a dual degree in PharmD/PhD and that these graduates primarily enter academia. Approximately 43(36%) Colleges and Schools of pharmacy offer a dual PharmD/MBA.

The career paths of PharmD/MBA graduates are less well described, but many are employed in managed care organizations and pharmaceutical industry.[1] Little is known about the career paths for other joint degree program graduates. The AACP estimates 3%, 2 %, 6% and 18% of Colleges and Schools of Pharmacy offer a dual degree in PharmD/MPA, PharmD/MSPAS, PharmD/JD and PharmD/MPH respectively.

Purpose/Problem

The University of Kentucky College of Pharmacy (UK COP) offers dual degree programs to provide students with the opportunity to enhance their interdisciplinary knowledgebase and skills. The four dual degree programs currently offered at the University of Kentucky College of Pharmacy are Masters of Business Administration (MBA), Masters of Public Health (MPH), Masters of Science in Physician Assistant Studies (MSPAS) and Masters of Public Administration (MPA). [a]

Dual Degree Programs Offered at University of Kentucky College of Pharmacy:

> **PharmD/Masters of Public Administration (MPA)**
> The Martin School of Public Policy and Administration Masters of Public Administration program provides a unique set of skills that complement the pharmacy curriculum. The MPA curriculum provides budgeting and accounting skills. Martin School professors teach management of large organizations; not just about the finances but also program and process management. Among these management skills are policy formulation and analysis. The program helps students to understand the politics involved in the management of larger organization.
>
> **PharmD/ Masters of Business Administration (MBA)**
> The Gatton College of Business and Economics Masters of Business Administration program provides skillsets that are complementary to the pharmacy curriculum. Coupling the MBA and pharmacy curriculum provides students with the essential educational knowledge to undertake managerial responsibility in a variety of health care settings. Cost-effective improvement of patient care outcomes is a desired goal of health

[a] From 2000-2010 a PharmD/MS Economics was offered and from 2008-2010 a PharmD/Masters in Public Policy was offered.

care today and is very challenging. Having expertise in management and business combined with clinical knowledge makes controlling health care costs feasible.

PharmD/Masters of Public Health (MPH)
The College of Public Health Masters of Public Health (MPH) Program is designed to increase the knowledge of population-based health issues for future public health professionals and clinical practitioners. Merging the didactic curriculum from the MPH program with the skills and knowledge from the pharmacy curriculum enables students to treat patients with diverse backgrounds. Health professionals will have the knowledge to assess disease states which affect certain populations and be able to treat the patients appropriately.

PharmD/ Masters of Science in Physician Assistant Studies (MSPAS)
The College of Health Sciences Masters of Physician Assistant Studies (MSPAS) is designed to prepare students to become Physician Assistants (PA). A Physician Assistant is allowed to perform physical examinations, interpret and evaluate diagnostic data, establish simple treatment plans, counsel and educate patients while under the supervision of a physician. Combining the medication knowledge established by the pharmacy curriculum and education from the MSPAS program, students will be proficient health care providers.

The faculty and professors quite frequently promote dual degree programs at University of Kentucky College of Pharmacy. While many advantages of a dual degree are intuitive, the factors that motivate a pharmacy student to pursue a dual degree have not been formally assessed. Furthermore, whether dual degree graduates pursue non-traditional career paths more often than single degree graduates (i.e. PharmD degree alone) is unknown.

The research questions are: 1.) Why do PharmD students pursue dual degree programs at the University of Kentucky College of Pharmacy? and 2.) Does obtaining a dual degree increase the likelihood of a “non-traditional” pharmacy jobs upon graduation?

Social Networking: A Professional Conundrum

The ideal way to quantify the skills obtained from dual degree students would be to ask their current and/or former employers. The reason being is that the employers will have the best knowledge of the graduates' skill sets and they can be unbiased. The survey should be anonymous, in order to 1) increase response for employers to complete it and 2) to encourage complete honesty. In most cases if a person can give an honest opinion via survey/questionnaire without being associated with it, then that person will most likely give an honest opinion.[3]

In order to get the survey to the employers it is important to know where UKCOP dual degree graduates were hired after graduation. It would be more efficient to create some sort of group network where the UKCOP dual degree graduates could all join. It would be a forum to ask questions about their jobs and opinions on survey questions. Thus a LinkedIN account was created.

LinkedIN is a social network catered to more professional users. Unlike Facebook and Twitter, it is used to promote careers instead of status updates. There are over 135 million users on LinkedIN with 77% of users above the age of 25; the average household income of users is $109,000.[4] LinkedIN, although not as popular as Facebook and Twitter, does not have the negative social connotation associated with Facebook and Twitter, where people can post multiple pictures, which can be deemed as unprofessional (i.e. drinking, partying).[4] LinkedIN focuses on professional information, and encourages users to construct an abbreviated Curriculum Vitae (CV) to establish "connections". This makes LinkedIN more attractive network for UKCOP dual degree graduates to join. I

created a group titled " University of Kentucky College of Pharmacy Dual Degree Graduates".

The main problem with LinkedIN is that it is not as popular as both Facebook and Twitter and therefore an explanation of its purpose to the UKCOP dual degree graduates was necessary to encourage them to join. A detailed email was sent introducing myself, my capstone project and providing instructions on how to create a LinkedIN account and join the group. The response rate was very poor from the initial email. Only 3 people joined the LinkedIN group and after a secondary email was sent, only 2 more people joined the LinkedIN group from the initial 45 emails sent.

Due to the poor response, it was decided that surveys of employers of dual degree graduates was not feasible for this capstone. A new focus was taken: a survey of current pharmacy students would be conducted to learn what motivates them to consider and/or pursue a dual degree. In addition, employment rates in "traditional" and "non-traditional" pharmacy jobs would be compared for dual degree graduates verses only PharmD graduates.

Literature Review

Overview

The literature review focuses on what motivates health professional students to pursue added degrees in pharmacy, medicine, nursing, and social work. It also focuses on survey questions used to assess the importance of added degrees in these respective programs.

Literature Review

Enderle[2] wrote an article entitled "Dual Degrees: Full Speed Ahead", which described the inception, explanation and purpose of dual degree programs in colleges/schools of pharmacy. Pharmacy schools began offering their first joint degree, which was a doctor of pharmacy and master of business administration (PharmD/MBA) nearly 30 years ago. The PharmD/MBA is still the standard option for many schools, and new dual degree programs are being created to help students "distinguish themselves in an increasingly crowded market." According to ACCP the most common reason for students pursuing a dual degree is their interest in the business and social aspects of healthcare. According to this paper, pharmacy schools offer dual degree programs in order to "prepare graduates for alternative non-academic pharmacy careers". Alternative non-academic pharmacy careers can include but are not limited to leadership positions in non-profit, for-profit and government health organizations.

Dr. Ruth Nemire, a pharmacist who is the founding dean of Medco School of Pharmacy at Fairleigh Dickinson University (FDU) stated that dual degrees pave a way for a "new generation of pharmacy school graduates with specialized knowledge and a bright future".[2] Dr. Nemire went on to state that the increase in dual degrees in pharmacy programs corresponds with the concept that there needs to be more clinicians who are well-rounded "team players". I believe the most impactful quote stated by Dr. Nemire in regards to the expansion and usefulness of dual degree programs in pharmacy was " Until now, we have not had pharmacist trained to do all of the things that we need to do." Essentially she means that the dual degree programs give the extra skillsets that

pharmacists were lacking. Moreover, these skillsets will help with patient care and the promotion of pharmacy as a career.

Ruth et al.[5] investigated motives, experiences and perspectives of graduates who were pursing a dual degree in Master of Social Work/Master of Public Health (MSW/ MPH) programs. The increase of MSW/MPH programs was to equip students with dual skill in public health social work (PHSW). There were 5 main themes for professional growth, which were (1) the unique process of choosing PHSW, (2) the experience of MSW/MPH training, (3) the transition from training to workplace, (4) experiences in the workplace, and (5) participants' thoughts on future innovations to improve PHSW. One professor stated that some students have "innate motivation" to challenge themselves beyond just one program. There were also some concerns by students in the dual degree program. One graduate of the MSW/MPH program stated that dual degree programs need to teach people how to define and market themselves. Another stated that the purpose of obtaining a dual degree is to show how to integrate classroom knowledge/skills in the workforce to better society, and professors need to do a better job of teaching students that skill. One student stated the quote that best summarizes the purpose of dual degree programs: "We are the future. Not only in public health and social work, but transdisciplinary curriculum seems to be the new wave of education because our society is becoming more integrated with different skills."

Chumney et al.[6] analyzed the academic experience and satisfaction of students who completed dual degree PharmD/MBA degree programs, which included long-term career choices and earning potential. They evaluated 76 students from South Carolina College of Pharmacy- using a 12-item survey instrument about job interviews, job offers,

eventual placement, starting salaries, and bonuses. The results of the survey showed that students who earned a dual-degree had greater amount of job interviews.(3.9 vs. 2.5, p = 0.013). Half of the graduates ended up in community pharmacy, regardless of their participation in the dual-degree program. It was also seen that dual degree students were less likely to enter to residency than their pharmacy graduate counterparts. One explanation could be that dual degree students feel that the second degree justifies not pursuing a residency. The salary and compensation were higher for dual degree students compared to non-dual degree students.

Keshishian[7] wrote an article "Factors Influencing Pharmacy Students' Choice of Major and Its Relationship to Anticipatory Socialization". The study used a survey consisting of 72 questions divided into 8 sections. Two hundred and fifteen pharmacy majors participated in the study. The majority of participants were Asian students (56.3%), and there were more females (54.4%) than males (43.3%). Pharmacy students were asked to rate their level of agreement with 6 common motivating factors for choosing pharmacy as a major on a 5-pointLikert scale (1=strongly disagree and 5= strongly agree). The highest reason for pursuing a pharmacy degree was to have many career opportunities. Students rated having many career opportunities significantly higher than the second-ranked reason, which was helping others ($p < 0.01$). There was no signi cant difference between the second-ranked reason and the third-ranked reason, providing an entry-level doctoral degree. However, this was rated signi cantly higher than the fourth-ranked motivator, wanting to nd a cure for chronic disease ($p < 0.01$). That reason was rated signi cantly higher than the fth-rated motivator, perceiving a better chance of being accepted into pharmacy school than medical school ($p<0.05$),

which was in turn ranked signi cantly higher than the lowest ranking motivator, not wanting to pursue a postgraduate degree ($p < 0.05$)

Steiber et al.[8] wrote an article in the *Pharmacy Times* that described "nontraditional pharmacy practices" offered to pharmacy students. There were several areas that they felt encompassed "non-traditional pharmacy" jobs. They included industry (manufacturing products, or research), distribution options, managed care jobs, and government jobs .The roles of pharmacists in these areas are atypical compared to the "traditional" practice, yet opportunities in "nontraditional" pharmacy practices have the potential to give greater impact on patient care. Specialty pharmacy practice, for example is considered a "nontraditional pharmacy practice" and is due to the new medications coming to market. Medication therapy management (MTM) and Risk Evaluation and Mitigation Strategies (REMS) are examples of services provided by specialty pharmacy. Pharmacists can also build strong relationships with patients as well as provide critical clinical outcome data directly to the pharmaceutical manufacturers. The potential to exceed in "non-traditional" pharmacy careers and expand the roles of pharmacists in healthcare, makes obtaining a dual degree very attractive.

Crimson et al.[9] published a report in 2009 entitled "The Role of Dual-Degree Programs in Colleges and Schools of Pharmacy". It stated that approximately 20% of PharmD graduates choose residency education and training upon graduation. However a substantial number of colleges/schools of pharmacy are offering pharmacy students alternative educational pathways to expand their post-PharmD career options in both pharmacy and the healthcare industry. Dual degree programs are the alternative educational that allow students to combine the skills developed through the PharmD

degree program with a new set of abilities developed through their concurrent enrollment and completion of other professional or graduate degree programs. The educational outcome of most dual degree programs is expanded students' expertise in disciplines that are valued in more nontraditional areas of pharmacy practice. Furthermore, enrollment in dual degree programs offers the participating student increased interaction with other health and non-healthcare professionals.

Summary of Literature Review

Although dual degree programs in colleges/schools are pharmacy are growing, there is little information regarding the impact of these programs on the students who enroll and graduate from them. Moreover, information on the impact these dual degree programs have had on the culture of the institution is minimal at best.

Some of the aforementioned studies identified possible reasons for pharmacy students choosing to pursue a dual degree. The common theme for pursuing a dual degree in any healthcare professional was career opportunities. The perception of having a dual degree is that one can have many options to pursue a career and the added degree can give a unique skillset to advance the profession. Dual degree programs represent an interdisciplinary curriculum, which is the new trend in our society. In essence, students are expected to be "well rounded" because policy makers expect providers to deliver coordinated, interdisciplinary care. This also raises the question: Are dual degree students more likely to go to "nontraditional pharmacy practices"

Methodology

Research Design

There are three main parts of this capstone project. The first part of this project is descriptive analyses of reasons that motivate first year pharmacy students (PY1) at the University of Kentucky College of Pharmacy (UKCOP) to pursue a dual degree. The second part of this project is to assess current second through fourth year dual degree pharmacy students (PY2-PY4) opinions of dual degree programs offered at the University of Kentucky College of Pharmacy. The first and second parts of this project will be assessed using survey questions. The third part of the project is to examine the career paths of existing University of Kentucky College of Pharmacy graduates.

Part 1: Identifying Motives for Pursuing a Dual Degree

The survey for the PY1 students was designed to identify factors that motivate students to pursue a dual degree using a 5-point Likert scale. For the PY1 students the survey was conducted through an Audience Response System (ARS) during a class period to guarantee a high response rate. An Audience Response System (ARS) is a communication technology that allows participants to interact with the lecturer; it usually merges with PowerPoint presentations. The lecturer may post multiple-choice or true-false questions on a PowerPoint slide, and then each student answers by pressing an individual keypad button corresponding to his/ her answer. These keypads, or "clickers", use a variety of technologies such as infrared or Wi-Fi technology, to communicate with a receiver, which is plugged into a universal serial bus (USB) port on the podium computer. After polling the audience, a bar graph of the classroom responses is displayed

on a projected slide. The responses of each individual may be saved and then later printed in a variety of report formats.[10] In order to maintain the anonymity in this survey, all PY1 students were asked to exchange their clicker with a different PY1 student. That way, it is clear that the responses are not linked to any specific individual. There were 13 questions created for PY1 students. It is short partly due to the survey being administered during lecture time and long surveys have a low response rate. Questions included demographics of the students, knowledge about the number of dual degree programs offered at University of Kentucky College of Pharmacy and reasons for pursuing a dual degree **(See Appendix 1 for a copy of the survey)**.

Part 2: Impressions of Dual Degree Programs

I identified all students who are currently in dual degree programs at University of Kentucky College of Pharmacy. This was done by obtaining the names and email address from the academic affairs office at the University of Kentucky College of Pharmacy. Next, I coordinated with the Director of Assessment at the University of Kentucky College of Pharmacy to administer a survey to dual degree students via a software called CourseEval™ by ConnectEdu®. CourseEval™ is software that gives students the ability to answer survey questions anonymously. The survey for current dual degree students contained 23 questions, including demographics and perceived advantages of obtaining a dual degree **(See Appendix 2 for a copy of the survey)**.

Part 3: Investigation of Dual Degree Graduate Career Paths

The American Association of Colleges of Pharmacy (AACP) conducts a "Pharmacy Graduate Student Survey" just prior to pharmacy school graduation. This survey is administered at all Colleges and Schools of Pharmacy in the U.S. and contains

sections which ask questions pertaining to "demographics," "professional competencies-outcomes", "doctor of pharmacy curriculum", "pharmacy practice experience", "student services", "the student experience", "facilities, experiential site", and "overall" thoughts about the program.

Completion of a dual degree program and career plans for PY4 students upon graduation are also collected. This information is helpful in assessing if obtaining a dual degree is an important factor in getting a "non-traditional" pharmacy job upon graduation. I obtained information for graduates of University of Kentucky College of Pharmacy from 2009, 2010 and 2011. These data were analyzed to determine the factors that contribute to students being employed in "non-traditional" pharmacy jobs.

Steiber et al [8] described "non-traditional pharmacy practices" as jobs in the industry (manufacturing products, or research), for example medical science liaison. The job duties entail communicating to health care providers the clinical and technical aspects of a product. Another non-traditional practice considered for pharmacists is wholesalers' management (i.e. AmerisourceBergen). Managed care jobs, which are also considered non-traditional, have pharmacists work with physicians on appropriate use of medications, reviewing drug utilization and/or negotiating formulary placements. Medication Therapy Management (MTM) and Risk Evaluation and Mitigation Strategies (REMS) are services under the umbrella of "specialty pharmacy" which are also considered non-traditional. Pharmacists in management roles, whether they are considered operations, marketing, managed care, purchasing, information systems and/or administration, are also considered "non-traditional". The Midwest Pharmacy Workforce Research Consortium conducted a survey in 2009 entitled "The National Sample Survey

of the Pharmacist Workforce" where they described non-traditional roles of pharmacists as "Other (non-patient care settings)"[11].

After an extensive search of the literature and due to lack of a concrete definition of "non-traditional" pharmacy careers, I will define the term "traditional" pharmacy career and "non-traditional" pharmacy career for purposes of my capstone. "Traditional" pharmacy careers will be considered community pharmacist (chain or independent), hospital staff pharmacist, clinical specialist pharmacist, and long-term care pharmacist. "Non-traditional" pharmacy careers will be considered research pharmacist, academia, pharmaceutical industry, managed care pharmacist, or a pharmacist within the local/federal/state government. I also included post-graduate education (i.e. residency, fellowship and graduate school) as "non-traditional". Table 1 below gives a summary of "Traditional" pharmacy careers verses "Non-traditional" pharmacy careers.

Table 1: "Traditional" vs. "Non-traditional" Pharmacy Careers

"Traditional" Pharmacy Careers	Community (Chain) Community (Independent) Hospital Staff Pharmacist Clinical Specialist Pharmacist Long-term Care Pharmacist
"Non-traditional" Pharmacy Careers	Research Pharmacist Academia Pharmaceutical Industry Managed Care Pharmacist Pharmacist within local/federal/state government Residency Fellowship Graduate school

In the AACP survey, all students are de-identified, and information about employment is indicated. Dual degree may not be the only factor contributing to

employment in "non-traditional" pharmacy jobs; there are some other factors, which should be considered. Alternate factors include, but are not limited to, a student's grade point average (GPA) and leadership experiences. Since these factors may not be available, proxies can help as indicators. A proxy for GPA is a student who is a member of Rho Chi Honor Society. Rho Chi's objective's is to promote the advancement of the pharmaceutical sciences through the encouragement and recognition of sound scholarship. High standards of intellectual and scholarly achievements are required for membership. A proxy for leadership is a student who is a member of Phi Lambda Sigma Fraternity. The purpose of Phi Lambda Sigma is to promote the development of leadership qualities in pharmacy. Phi Lambda Sigma serves as the highest goal that a student of pharmacy can achieve in the area of leadership and service. Unfortunately, the AACP database does not collect this information so I am not able to include these two important qualities (GPA and leadership) in my model for predicting "non-traditional" pharmacy careers.

The equation below is how I analyzed the data in order to answer the aforementioned research question:

[**Non-traditional Pharmacy job at graduation**]= F (year of graduation, dual degree, gender, age, pre-pharmacy education, debt, career advice, research experience, choose pharmacy again)

Here is an explanation for the choice of variables. The year of graduation was a variable because that was the information provided to me initially by ACCP. Dual degree is in the equation because that is variable of interest, that I hypothesize leads to more non-traditional pharmacy careers. The gender of a graduate is a variable because it could

influence whether an individual pursues a certain career path, due to potential circumstances (i.e pregnancy). The University of Kentucky College of Pharmacy does not require students to have a bachelor's degree prior to entering pharmacy school, therefore a feeling of mental exhaustion from school and experience may sway a student with a bachelor's or master's degree differently than a student with two or three years pre pharmacy coursework. Student debt is a useful variable because it is expensive to attend pharmacy school, therefore students with more debt may want to pay back loans immediately and pursue a traditional career rather than non-traditional pharmacy careers. Career advice is an interesting variable because information about possible non-traditional pharmacy careers can influence graduates to be open-minded to alternative career paths. Research experience is a vital variable because one can think students involved with research while attending pharmacy school will be more willing to have a non-traditional pharmacy career. Lastly, graduates were asked would "they choose pharmacy again" if given the choice, and responses to that question are important, because individuals who would not choose pharmacy again may not be interested in traditional pharmacy careers.

Statement of potential ethical issues including human subjects issues: This study was performed under the University of Kentucky College of Pharmacy IRB protocol "Student Assessments in Completing Curricular Accreditation Requirements"

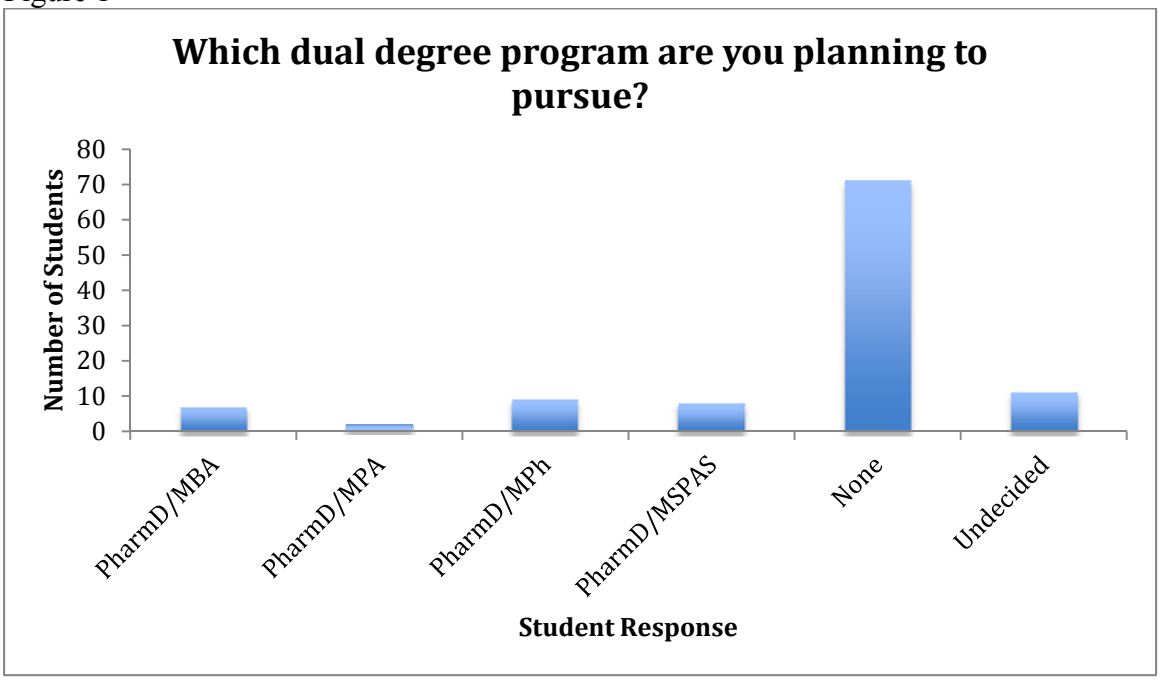
RESULTS

PY1 Survey Results: Descriptive Analysis

Using Audience Response System (ARS) to administer the survey, 108 out of 132 students completed the survey giving a response rate of 81.8%. The majority of students in the PY1 class are females (65.42%) and are between the ages of 18-23 (69.44%). The majority of the students either had a bachelor's degree (57.94%) or completed 3-year pre pharmacy coursework (32.71%) before attending pharmacy school.

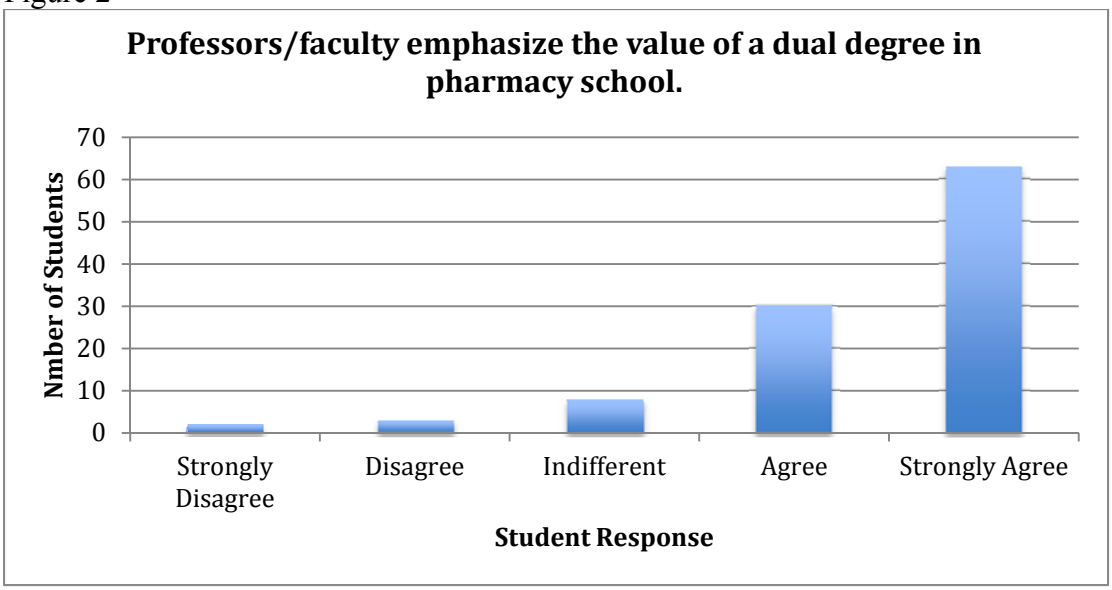
When asked which dual degree program are you planning to pursue, 71 (65.74%) PY1 students responded "None" (See Figure 1 below)

Figure 1



A combined 93 (87.73%) PY1 students responded that they either "agree" or "strongly agree" that professors/faculty emphasize the value of a dual degree in pharmacy school. (See Figure 2 below)

Figure 2



A combined 71 out of 106 PY1 students (66.98%) responded "agree" or "strongly agree" that obtaining a dual degree will lead to a higher chance of advancing in their career. (See Figure 3 below)

Figure 3

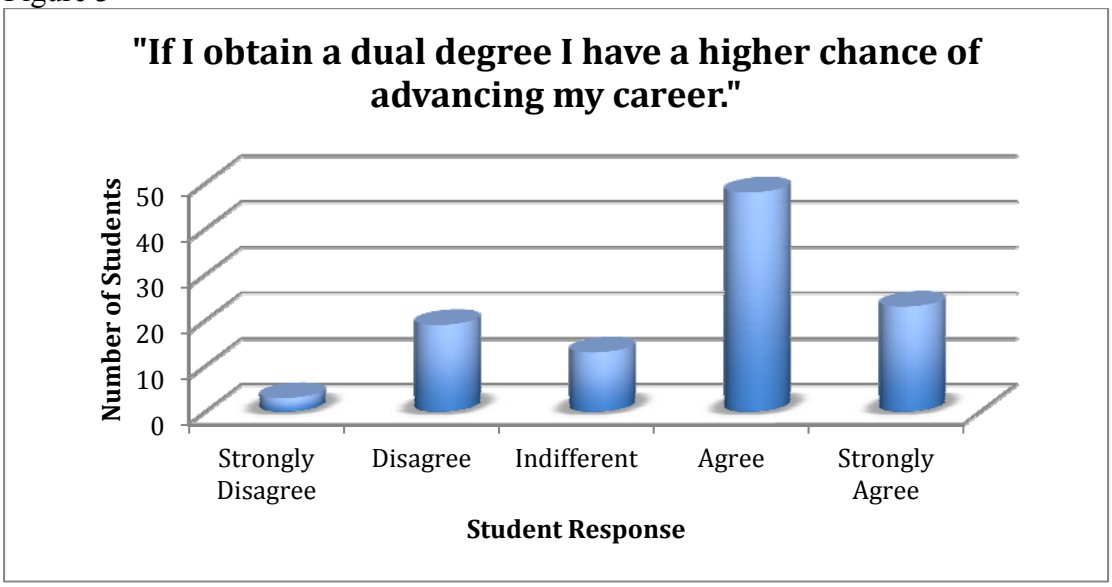


Figure 4 shows the desired career paths of PY1 students when they graduate pharmacy school. Using the definition I created for "traditional" versus "non-traditional" pharmacy careers, Figure 5 indicates that 84.26% of PY1 students desire a "traditional"

pharmacy career path. (See Figures 4 and 5 below). For complete data from PY1 survey see **Appendix 3**

Figure 4

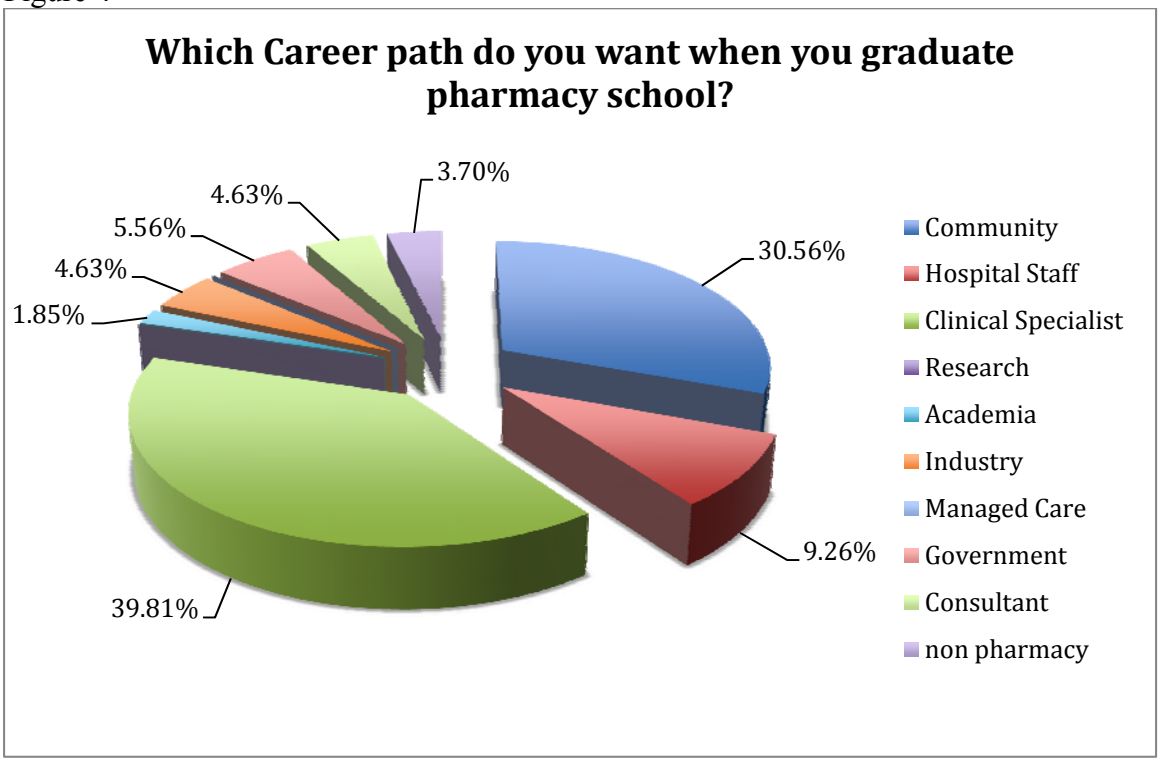
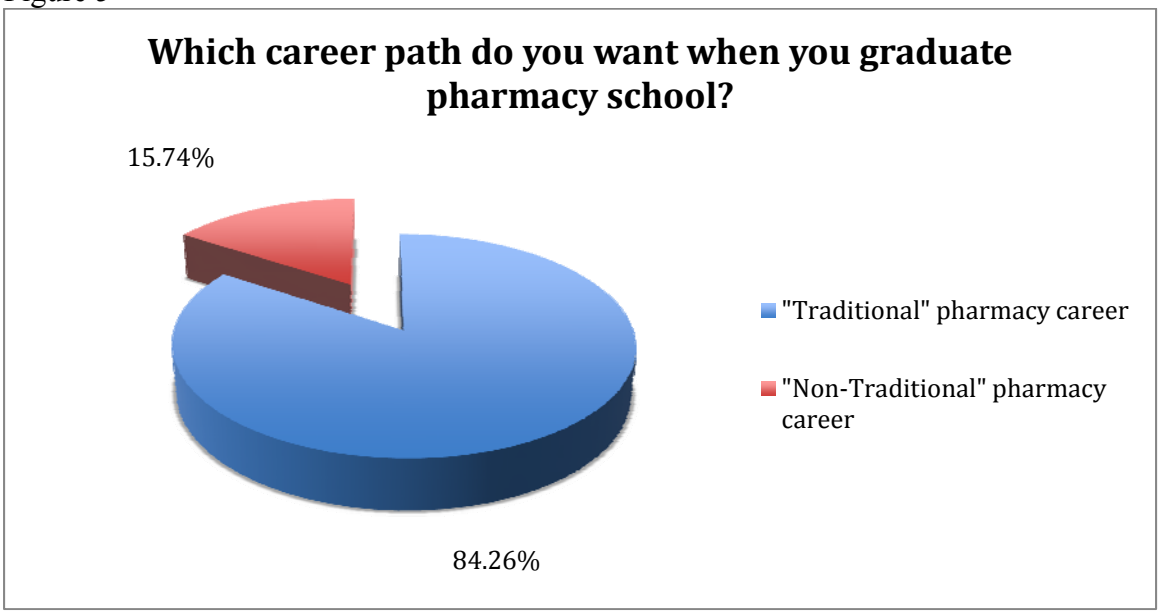


Figure 5



Part 2: PY2-PY4 Dual Degree Students Survey Results: Descriptive Analysis

The PY2 through PY4 dual degree students received their surveys electronically through CourseEval™. There are currently 60 dual degree students, of which 54 are "active" students which means they are still in their respective program. Six students have dropped their dual degree program before the survey was administered; however, I wanted to give them an opportunity for feedback. The response rate was 73.7% with 45 out of 61 dual degree students completing the survey.[b]

The majority of dual degree students were male (51%) and between the ages of 24-29 (53%). Approximately 47% of dual degree students completed 3 years of pre-pharmacy coursework before attending pharmacy school; nonetheless, 42% of dual degree students obtained a bachelor's degree before attending pharmacy school. There was an even distribution of dual degree students who completed the survey that were PY2, PY3 or PY4 (17, 13, and 15 respectively).

[b] I did not complete the survey, and if you exclude me the response rate goes up slightly to 45/60 (75%)

Figure 6 indicates that the majority of dual degree students that completed the survey were in the PharmD/MBA or PharmD/MPH programs. (See Figure 6 below)

Figure 6

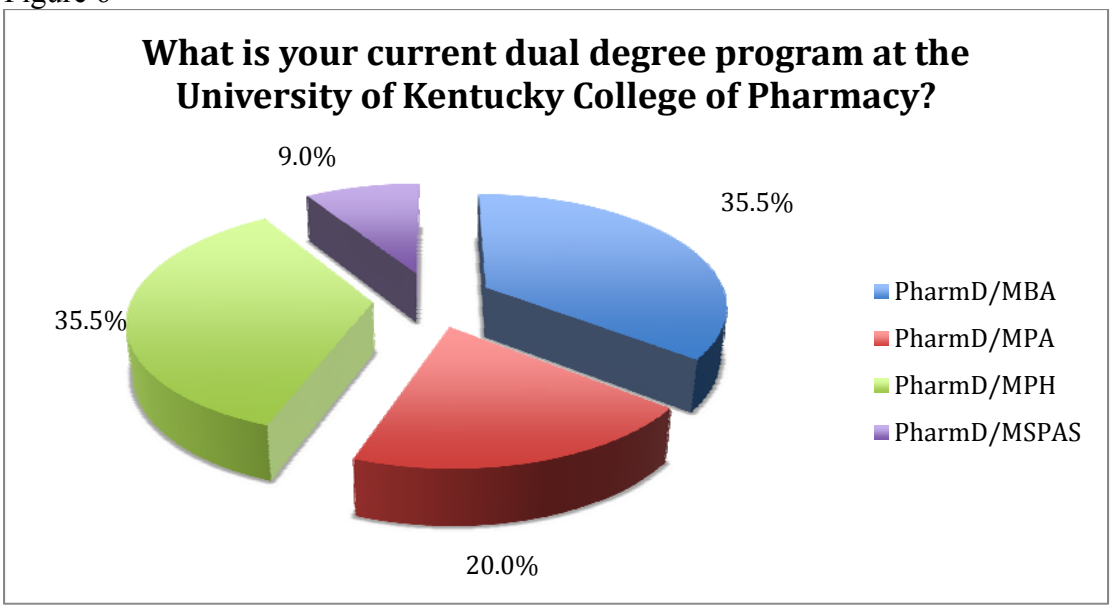


Figure 7 shows that a combined 96% of dual degree students felt that coursework in their dual degree program was either “much easier” or “easier” than their pharmacy coursework. (See Figure 7 below)

Figure 7

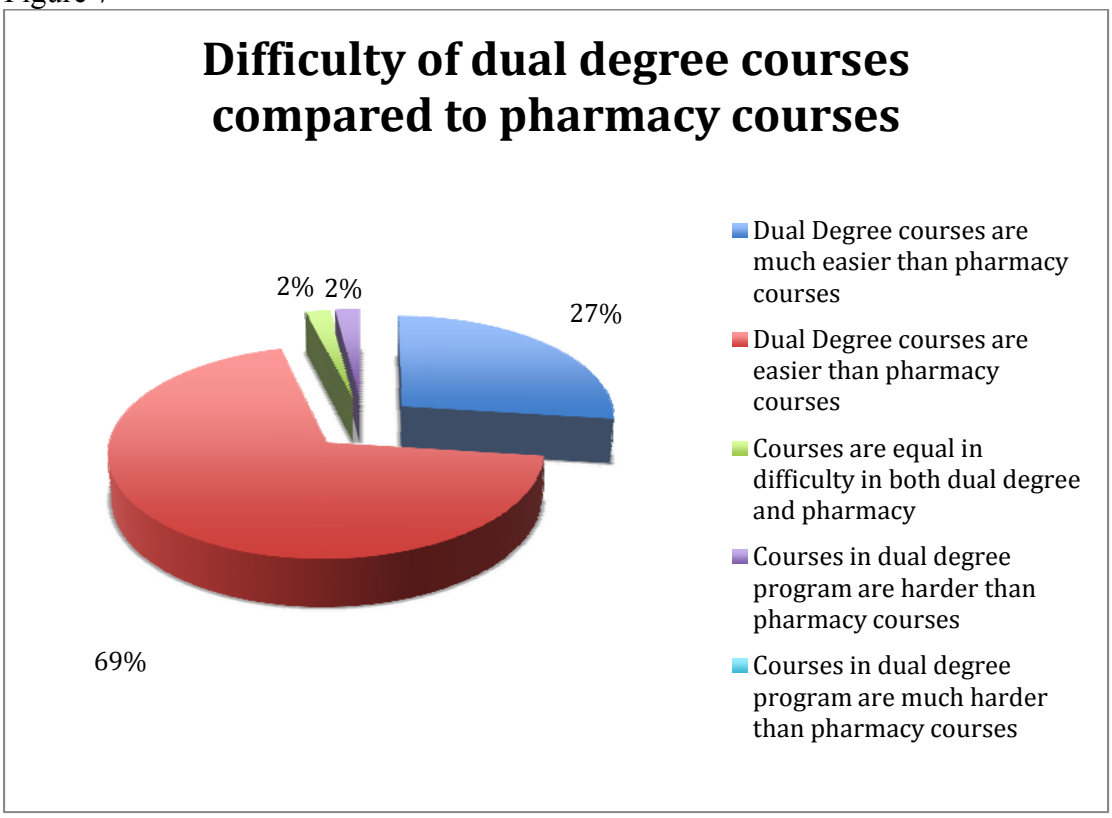
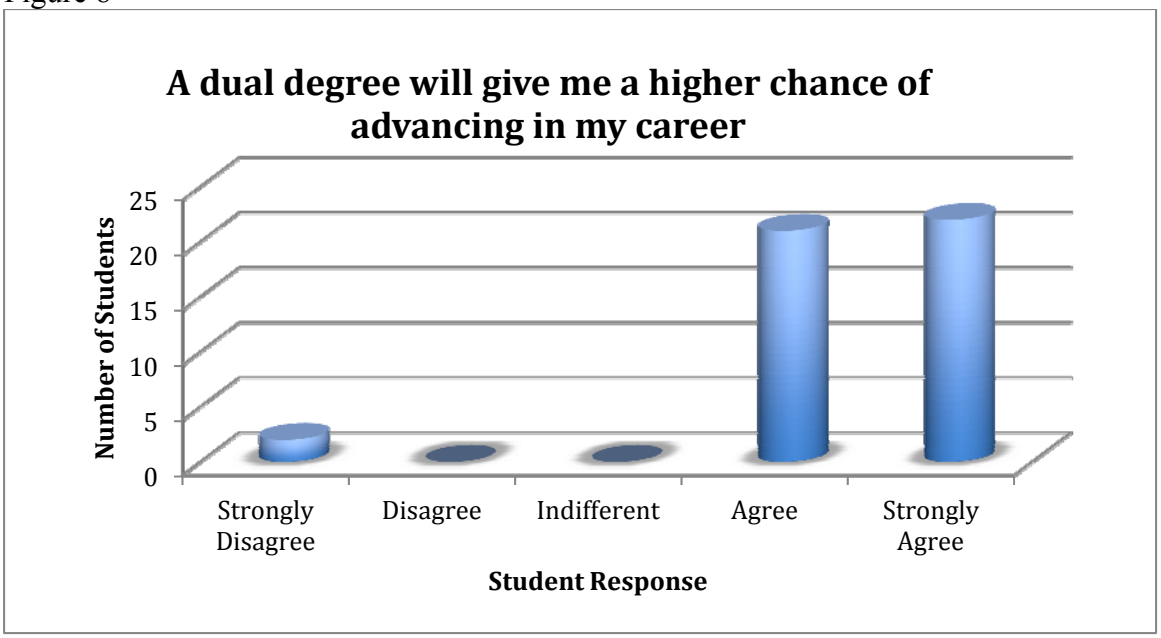


Figure 8 indicates that 43 out of 45 dual degree students (96%) believe a obtaining a dual degree will give a higher chance of advancing in their career. (See Figure 8 below)

Figure 8



According to Figure 9, a combined 78% of dual degree students "agree" or "strongly agree" that they would pursue a dual degree while at the University of Kentucky College of Pharmacy if they had to do it all over again. (See Figure 9 below)

Figure 9

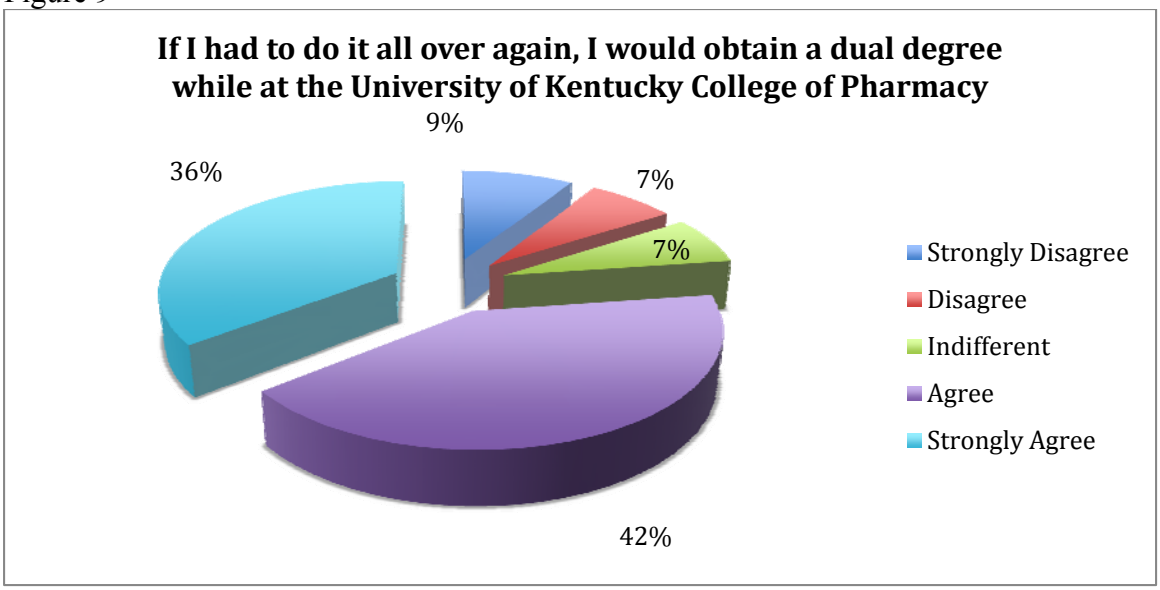


Figure 10 shows that an equal number of 12 (27%) dual degree students both "disagree" and "agree" that obtaining a dual degree will lead to a higher salary; whereas 14 (31%) dual degree students are indifferent in regards to believing that a dual degree will lead to a higher salary. (See Figure 10 below)

Figure 10

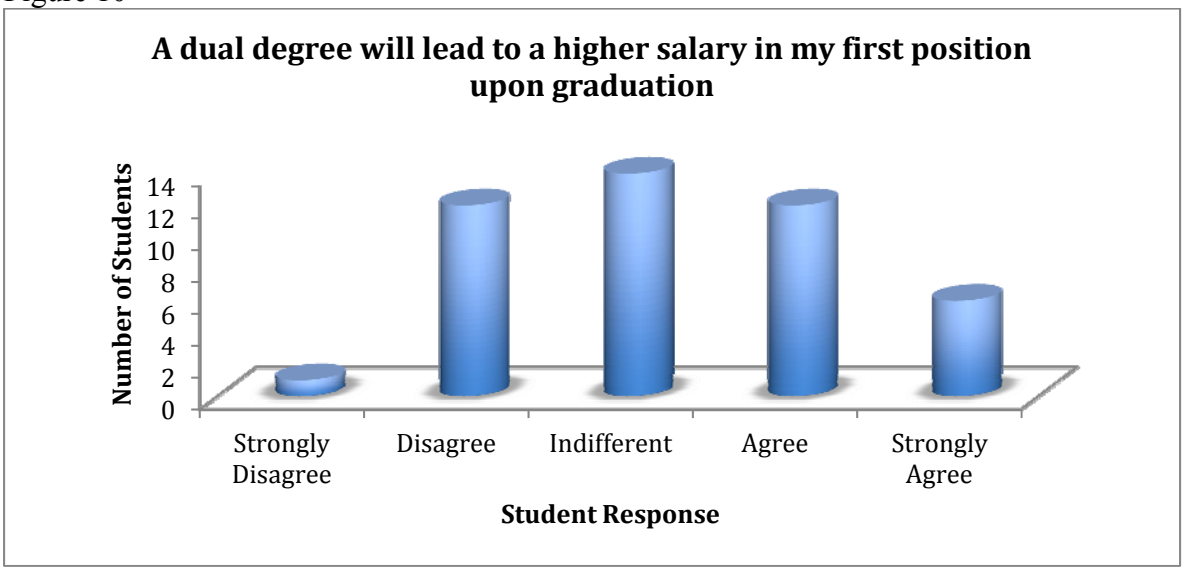


Figure 11 shows the desired career paths of PY2-PY4 dual degree students when they graduate pharmacy school. Using the definition I created for "traditional" pharmacy careers versus "non-traditional" pharmacy careers, Figure 12 indicates that 36% of PY2-PY4 dual degree students desire a "non-traditional" pharmacy career path. (See Figures 11 and 12 below) For complete data from PY2-PY4 dual degree students survey see **Appendix 4**

Figure 11

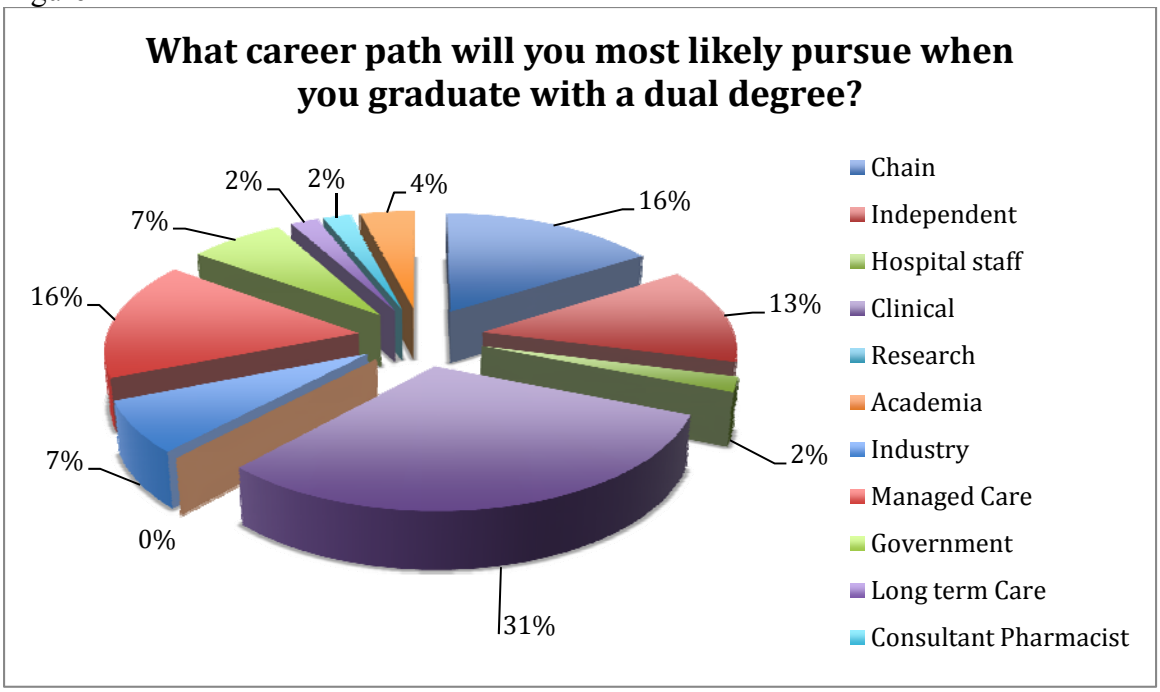
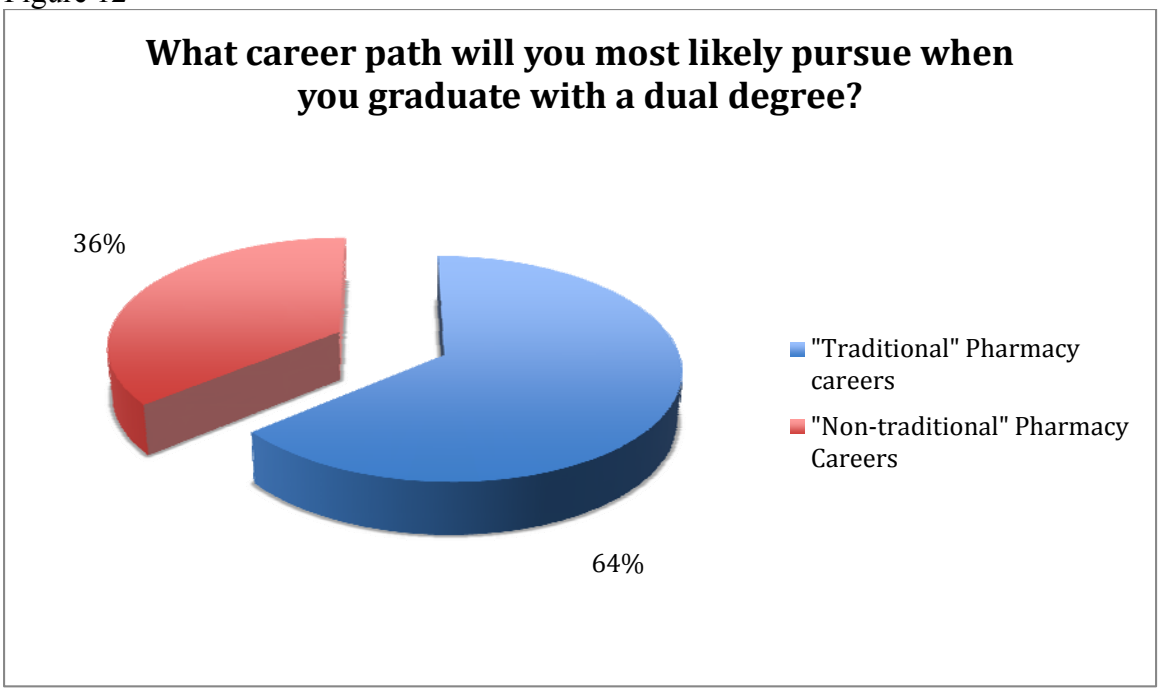


Figure 12



Part 3: Investigation of Dual Degree Graduates Career Paths: Statistical Analysis

In the logistic model for the ACCP data, the responses "disagree" and "strongly disagree" were combined (due to few responses) for the questions about career advice, research opportunities, and choose pharmacy again.

Figure 13 indicates that the likelihood of obtaining a "non-traditional" pharmacy career was significant for graduates from the year 2010. The chi-squared value of 6.3876 exceeds the critical value of 3.841 and the corresponding p-value in year 2010 which was 0.0115, was less than the 0.05. The variable "dual degree" was very close to significant, with a chi squared value of 3.779 and p value of 0.0519 (See Figure 13 below).

Figure 13

Analysis of Maximum Likelihood Estimates						
Parameter		**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept		1	-0.6922	0.4478	2.3895	0.1222
Year	**2010**	1	0.8194	0.3242	6.3876	0.0115
Year	**2011**	1	0.2316	0.3351	0.4775	0.4896
Gender		1	-0.3919	0.2680	2.1387	0.1436
Age	**1**	1	-0.6248	0.3714	2.8297	0.0925
Age	**2**	1	-1.0159	0.8607	1.3930	0.2379
Age	**3**	1	-0.6211	0.7983	0.6053	0.4366
Pre_pharmacy_degrees	**1**	1	-0.0475	0.3586	0.0176	0.8945
Pre_pharmacy_degrees	**2**	1	0.8586	0.8851	0.9409	0.3321
Dual_Degree		1	0.9045	0.4653	3.7779	0.0519
Debt_		1	-3.34E-6	2.402E-6	1.9313	0.1646
career_advice_ind	**0**	1	0.8252	0.4486	3.3844	0.0658
career_advice_ind	**2**	1	0.6392	0.4051	2.4891	0.1146
career_advice_ind	**3**	1	-0.5822	0.5444	1.1436	0.2849
research_ind	**0**	1	0.7141	0.9058	0.6215	0.4305
research_ind	**2**	1	-0.1418	0.3301	0.1846	0.6675
research_ind	**3**	1	-0.5363	0.4750	1.2748	0.2589
choose_pharmacy_agai	**0**	1	0.5153	0.7891	0.4264	0.5138
choose_pharmacy_agai	**2**	1	-0.0792	0.3126	0.0641	0.8001
choose_pharmacy_agai	**3**	1	0.4520	0.4561	0.9821	0.3217

Figure 14 shows that the odds ratio between 2010 vs. 2009 was significant, as the 95% confidence interval does not include 1. The variable dual degree was close to significant with a 95% confidence interval of 0.992 to 6.151. (See Figure 14 below)

Figure 14

Odds Ratio Estimates			
Effect	**Point Estimate**	**95% Wald Confidence Limits**	
Year 2010 vs 2009	2.269	1.202	4.284
Year 2011 vs 2009	1.261	0.654	2.431
Gender	0.676	0.400	1.143
Age 1 vs 0	0.535	0.259	1.109
Age 2 vs 0	0.362	0.067	1.956
Age 3 vs 0	0.537	0.112	2.569
Pre_pharmacy_degrees 1 vs 0	0.954	0.472	1.926
Pre_pharmacy_degrees 2 vs 0	2.360	0.416	13.375
Dual_Degree	2.471	0.992	6.151
Debt_	1.000	1.000	1.000
career_advice_ind 0 vs 1	2.282	0.947	5.498
career_advice_ind 2 vs 1	1.895	0.857	4.192
career_advice_ind 3 vs 1	0.559	0.192	1.624
research_ind 0 vs 1	2.042	0.346	12.056
research_ind 2 vs 1	0.868	0.454	1.657
research_ind 3 vs 1	0.585	0.231	1.484
choose_pharmacy_agai 0 vs 1	1.674	0.357	7.861
choose_pharmacy_agai 2 vs 1	0.924	0.501	1.705
choose_pharmacy_agai 3 vs 1	1.571	0.643	3.842

Discussion

The results from the surveys were very interesting and informative. In the Ruth et al.[5] article one of the issues stated was the attribution of professors to the the lack of marketing for dual degree programs. As shown in Figure 2, over 87% of PY1 students believe that professors/faculty at UKCOP emphasize the value of a dual degree while in pharmacy school. When the PY2-PY4 dual degree students were asked the same question, 63% of them agreed that professors/faculty at emphasize the value of a dual degree. This may show that professors/faculty at UKCOP have made a conscious effort to improve the marketability of the dual degree programs.

Also, The University of Kentucky College of Pharmacy made an administrative change in how the dual programs are managed in 2010 when an Associate Dean was administratively charged with dual degree program oversight, thus providing both the manpower and the financial resources for the dual programs (prior to 2010 there was no official faculty effort assigned to the dual degree programs, nor were there any financial resources for the programs). By placing this administrative role in the Dean's office, necessary resources are now available to promote dual degree programs at the pre-pharmacy / pharmacy recruitment phases.

In the Chumney et al.[6] article half of pharmacy school graduates pursued a career in community pharmacy regardless of participation in the dual degree program. As shown in Figure 12, 36% of dual degree students stated they were interested in "traditional" pharmacy careers. The majority of dual degree students, 64%, were interested in "non-traditional" pharmacy careers.

In Keshishian et al.[7] article the primary reason for pursuing a pharmacy degree was to have many career opportunities. In the current project, a similar open-ended response question was asked to dual degree pharmacy students: "What was the primary factor that motivated you to pursue a dual degree?". I identified four common themes, which were: "differentiation", "free degree", "higher salary" and "interesting material". The majority of students stated that they chose their respective dual degree program to differentiate themselves from pharmacy peers and become more marketable (40%). The next reason for pursuing a dual degree was that students could obtain a second degree and not pay extra tuition, in essence a "free degree" (20%). Surprisingly only 5% of dual degree students indicated they wanted the degree because of higher salary, and 7% of students pursued the dual degree due to interest in another subject matter besides pharmacy.

The Steiber et al.[8] article about "nontraditional pharmacy practices" asked if dual degree students are more likely to go to "nontraditional pharmacy practices". According to Figure 12, 36% of dual degree students were interested in a pharmacy career path that are considered "non-traditional", which is more than double the percentage of PY1 students (~16%) who were interested in "non-traditional" pharmacy careers. Although it is still early to tell for PY1 students the statistical analysis of dual degree students verses non-dual degree students will confirm or refute these results.

In Figure 14, students who graduated in 2010 are 2.269 times more likely to have "non-traditional" jobs than those who graduated in 2009, and this result is statistically significant (the 95% Confidence interval does not include 1), it is unknown why this difference occurred between the 2009 and 2010 graduates.

Interestingly, students who participated in the dual degree programs are 2.471 times more likely to have "non-traditional" jobs than those who did not graduate with a dual degree. This result, although not quite statistically significant at the 0.05 level (the 95% Confidence interval is 0.992-6.151) indicates that the variable may be an important factor.

Limitations

There were high response rates for both first year pharmacy students (PY1) and dual degree students (PY2-PY4) surveyed (81.8% and 73.7% respectively). However, one important limitation of this study was the small sample size of first year pharmacy students (135) and dual degree students (61) surveyed. That is to be expected since the survey was conducted in a single center site (University of Kentucky College of Pharmacy) and although this increases internal validity, it may weaken external validity. The results of this study may be difficult to generalize the other colleges/schools of pharmacy. In order to improve external validity, I could have sent the surveys to first year pharmacy students and dual degree students at other colleges/schools of pharmacy.

A second limitation was for the logistic regression analysis. If I could have obtained data relative to the GPA and leadership qualities of all the pharmacy graduates and linked them with the ACCP survey data it would have strengthened the model that used to assess factors contributing to pharmacy graduates obtaining a "non-traditional" pharmacy job.

Conclusions and Implications

The data from this study answers the question asked about why pharmacy students want to pursue a dual degree program and if obtaining a dual degree will increase the probability of a "non-traditional" pharmacy job upon graduation.

Ironically, although a majority of PY1 students (65.7%) stated that they did not want to pursue a dual degree, the majority of students felt that a dual degree would help them advance in their career, provide greater job security and increase chances of getting accepted into a residency or fellowship program. This may indicate that PY1 students agree there is great value in a dual degree but they may feel that it takes too much effort. This was reflected in "differentiation" being the most common theme for pursuit of a dual degree whether it was for a job market or a residency/fellowship program. It seems dual degree students are aware of the competition for pharmacy jobs and they want to be more competitive upon graduation.

Interestingly only about 16% of PY1 students see themselves in 'non-traditional' jobs (Figure 5), but this number more than doubles (36%) for students who are actively engaged in dual degree programs as indicated in Figure 12. Therefore, one thought is that the dual program opens students' minds to alternate careers they can pursue with their dual degree. An alternative thought is that students who are considered "open minded" may self select into dual degree programs. Also, maybe dual programs offer new opportunities (i.e. participation in research and capstone projects) that would have never been pursued if they never participated in dual degree program.

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Appendix 1: PY1 Students Survey Questions

1.) What is your gender?

- Male
- Female

2.) What is your age range?

- 18-23
- 24-29
- 30-35
- 36-41

3.) What was your highest level of education before entering pharmacy school?

- 2 year pre pharmacy coursework
- 3 year pre pharmacy coursework
- Bachelors degree
- Masters degree
- Doctoral degree

4.) How many dual degree programs are offered at the University of Kentucky College of Pharmacy?

- 1
- 2
- 3
- 4
- 5
- 6

5.) Which dual degree program are you planning to pursue?

- PharmD/MBA
- PharmD/MPA
- PharmD/MPH
- PharmD/MSPAS
- None/not interested
- Interested but undecided

6.) Which statement(s) below do you agree with the most, in regards to your reason for your interest in a dual degree program? (choose all that apply: up to 2)

- I believe that the UK College Of Pharmacy offers preferential treatment to dual degree students in experiential educational rotations
- There aren't enough good electives to take unless I am in a dual degree program
- A dual degree program will make me a better candidate for residency positions
- I am not interested in a dual degree program

7.) Which statement (s) below do you agree with the most, in regards your interest in a dual degree program? (choose all that apply: up to 2)

- I am interested in the subject matter in another program
- A dual degree program will provide me with knowledge and skills I need for my future career
- I can't pass up the opportunity to get 2 degrees for the price of 1.

8.) To what level do you agree or disagree with this statement:
Professors/faculty emphasize the value of a dual degree in pharmacy school.

- 1-Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly agree

9.) To what level do you agree or disagree with this statement:
Obtaining a dual degree will lead to a higher salary in a position upon graduation.

- 1-Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly Agree

10.) To what level do you agree or disagree with this statement:
"If I obtain a dual degree I have a higher chance of advancing in my career".

- 1-Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly Agree

11.) To what level do you agree or disagree with this statement:
Obtaining a dual degree gives me an advantage for getting accepted into a residency/fellowship program.

- 1-Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly Agree

12.) To what level do you agree or disagree with this statement:
Obtaining a dual degree would provide greater job security.

- 1- Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly Agree

13.)Which career path do you want when you graduate in pharmacy?

- Community Pharmacist (Chain, or independent)
- Hospital Staff Pharmacist,
- Clinical Specialist Pharmacist
- Research Pharmacist
- Academia
- Pharmaceutical Industry
- Managed Care
- Pharmacist within local/state/federal government
- Long Term Care or Consultant pharmacist
- Job outside the profession of pharmacy
- Don’t know

Appendix 2: PY2-PY4 Dual Degree Students Survey Questions

"Greetings [insert name]

I hope everything is going well with rotations and or classes; I am currently working on my capstone project along with Dr. Blumenschein. My capstone project will assess the impressions of PharmD students who are currently in one of the dual degree programs at the University of Kentucky College of Pharmacy. My project will also analyze if dual degree programs increase the likelihood of students obtaining "non-traditional" pharmacy jobs upon graduation. The survey is short and it will be anonymous. I appreciate your time and look forward to hearing from you soon."

1.) What is your Gender?
- Male
- Female

2.) What is your age range?
- 18-23
- 24-29
- 30-35
- 36-41
- Over 41

3.) What was your highest level of education before entering pharmacy school?
- 2 year pre pharmacy coursework
- 3 year pre pharmacy coursework
- Bachelors degree
- Masters degree
- Doctoral degree

4.) What is your current status in Pharmacy School?
- PY2
- PY3
- PY4

5.) Please select the dual degree program that you are a part of:

- PharmD/MBA
- PharmD/MPA
- PharmD/MPH
- PharmD/MSPAS

6.) In an average week, how many hours do you study for your dual program courses? Only include hours spent studying for dual degree program coursework, not time spent studying for PharmD coursework.

- 0-2 hours
- 2-4 hours
- 4-6 hours
- 6-8 hours
- >8 hours

7.) Overall, how would you rate the difficulty of dual degree courses compared to pharmacy school courses?

- Courses in the dual degree program are much easier than pharmacy school courses
- Courses in the dual degree program are easier than pharmacy school courses
- Courses in the dual degree program are equal in difficulty to pharmacy school courses
- Courses in the dual degree program are harder than pharmacy school courses
- Courses in the dual degree program are much harder than pharmacy school courses

8.) Overall, how would you rate the accessibility of professors in the dual degree program relative to professors in Pharmacy school ?

- Professors in the dual degree program are much more accessible than pharmacy school professors
- Professors in the dual degree program are more accessible than pharmacy school professors
- Professors in the dual degree program have equal accessibility to professors in the pharmacy program
- Professors in the dual degree program are less accessible than pharmacy school professors
- Professors in the dual degree program are much less accessible than pharmacy school professors

9.) How much do you interact with non-pharmacy students in the dual degree program?

- I interact when we have assignments in class
- I interact when we have assignments in and outside of class
- I interact outside of class without an assignment
- I don't interact with non-pharmacy students in my dual degree program

10.) To what level do you agree or disagree with this statement: My dual degree program provides advising/guidance/assistance beyond what is provided within the College of Pharmacy by Pharmacy faculty.

- 1-Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly Agree

11.) To what level do you agree or disagree that obtaining a dual degree will lead to a higher salary in your first position upon graduation?

- 1-Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly Agree

12.) To what level do you agree or disagree that obtaining a dual degree will give you a more flexible work schedule in your first position upon graduation?

- 1-Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly agree

13.) To what level do you agree or disagree that College of Pharmacy professors/faculty emphasize the value of a dual degree in pharmacy school?

- 1-Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly agree

14.) To what level do you agree or disagree that obtaining a dual degree will give you the ability to work in the city and state of your choice?

- 1-Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly Agree

15.) To what level do you agree or disagree with this statement:
"If I obtain a dual degree I have a higher chance of advancing in my career".

- 1-Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly Agree

16.) To what level do you agree or disagree that obtaining a dual degree gives you an advantage for getting accepted into a residency/fellowship program?

- 1-Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly Agree

17.) To what level do you agree or disagree that obtaining a dual degree will give you greater job security?

- 1- Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly Agree

18.) To what level do you agree or disagree with the following statement: "Knowing what I know now, if I had to decide all over again whether to obtain a dual degree while at University of Kentucky College of Pharmacy, I would choose to pursue a dual degree."

- 1-Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly Agree

19.) To what level do you agree or disagree with the statement: “Courses in my dual degree program are interesting.”

- 1-Strongly disagree
- 2-Disagree
- 3-Indifferent
- 4-Agree
- 5-Strongly Agree

20.) If your answer to the previous question was “Strongly disagree” or “disagree”, please explain your reason for choice.

Open response

21.) Please list three specific skills that you have learned while from your dual degree program that are not taught in PharmD coursework.

Open response

22.)What career path do will you most likely pursue when you graduate with a dual degree?

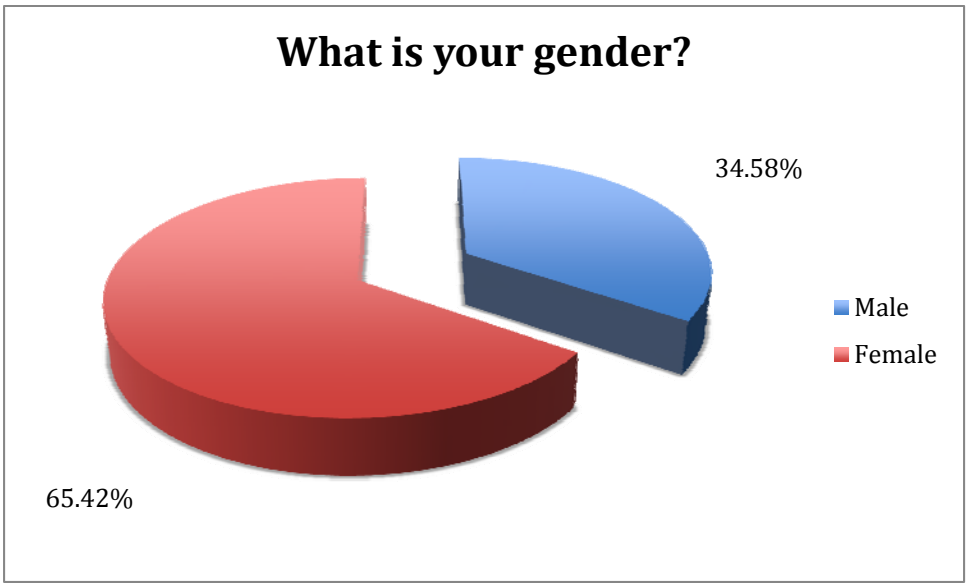
- Community Pharmacist (Chain)
- Community Pharmacist (Independent)
- Hospital Staff Pharmacist
- Clinical Pharmacist
- Research Pharmacist
- Academia
- Pharmaceutical Industry
- Managed Care
- Pharmacist within local/state/federal government
- Long Term Care
- Consultant pharmacist (not long term care
- Job outside the profession of pharmacy

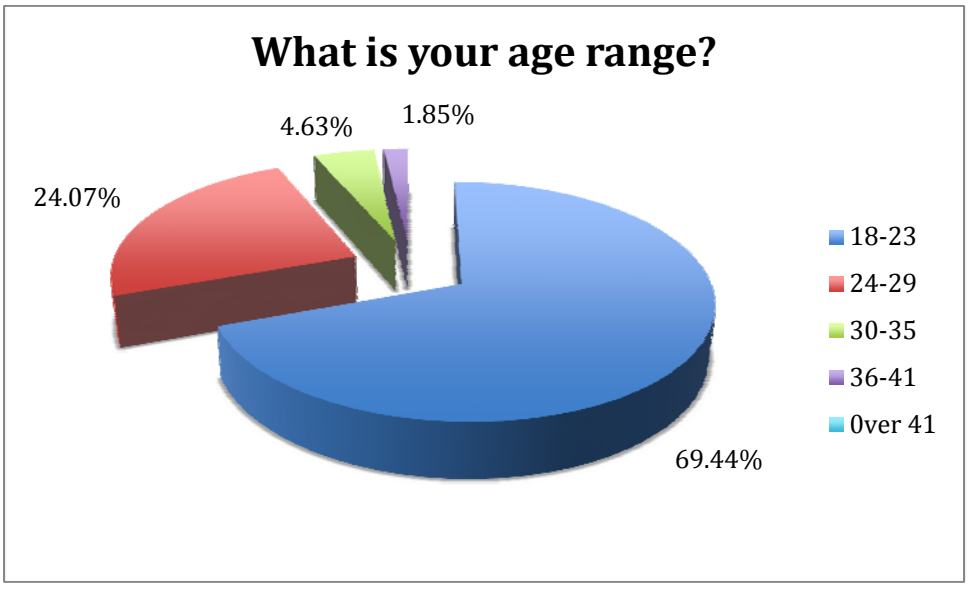
23.) What was your primary factor that motivated you to pursue a dual degree?

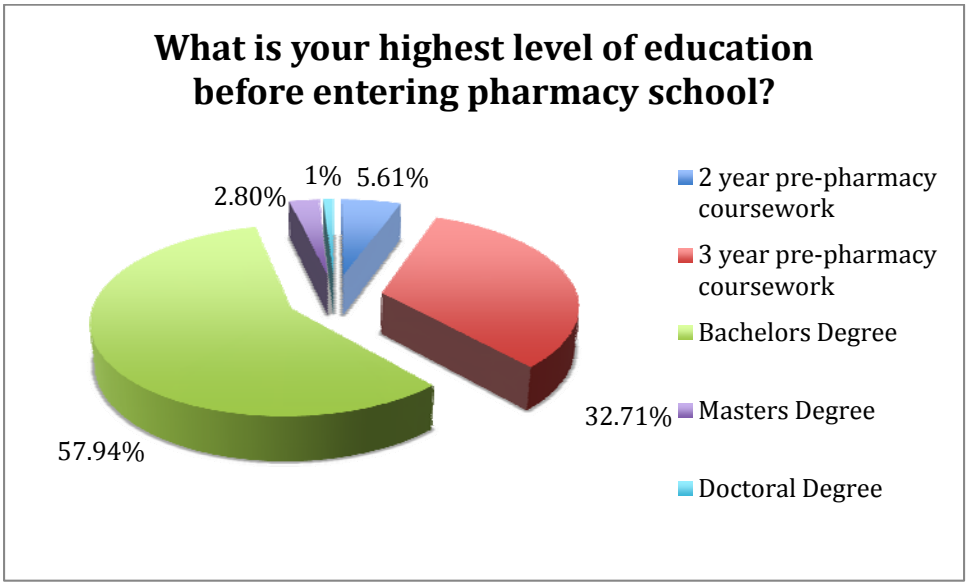
Open response

Appendix 3: Results from PY1 Students Survey

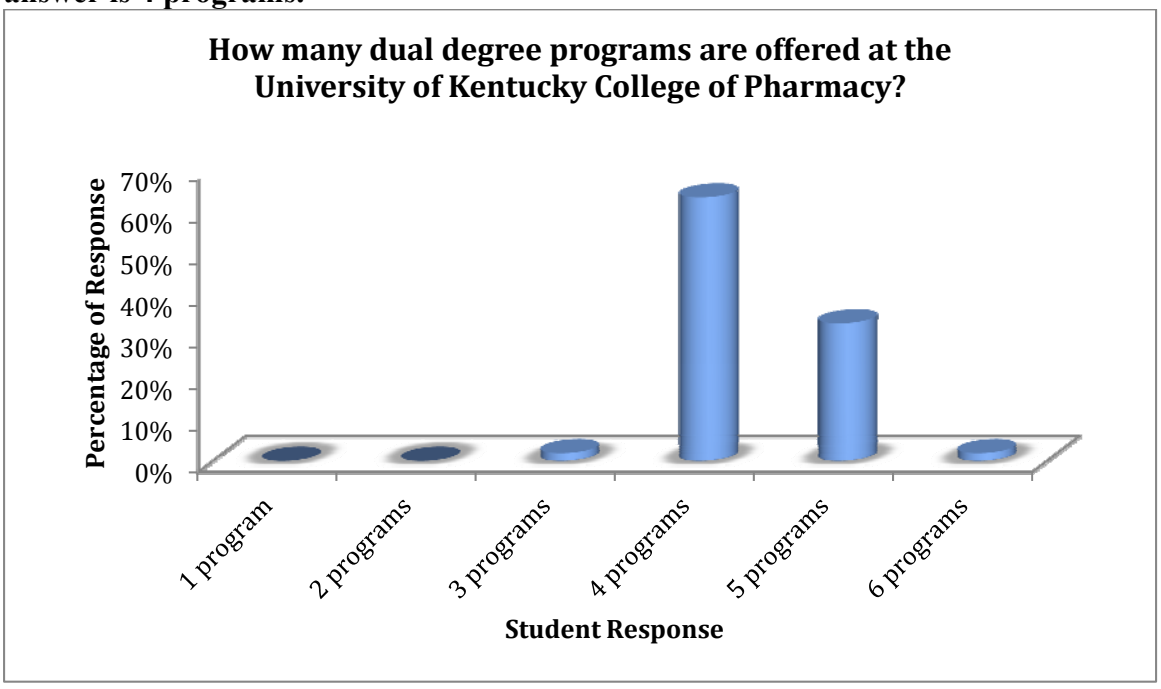
Response Rate: 81.8% (108 out of 132 students)

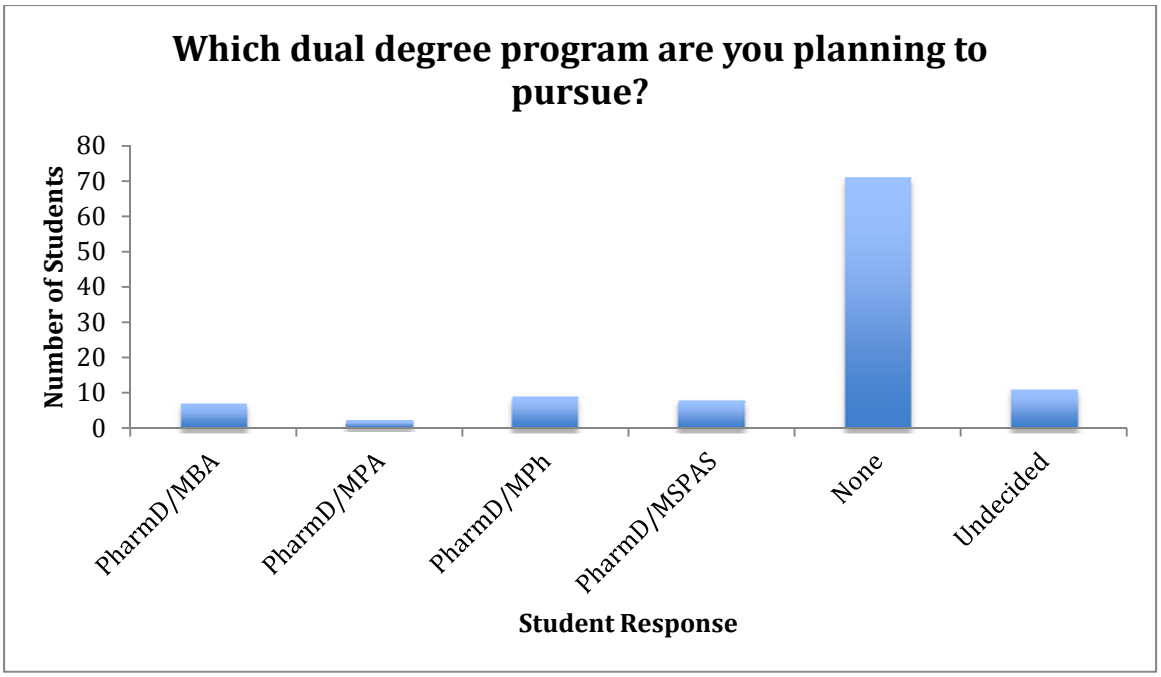


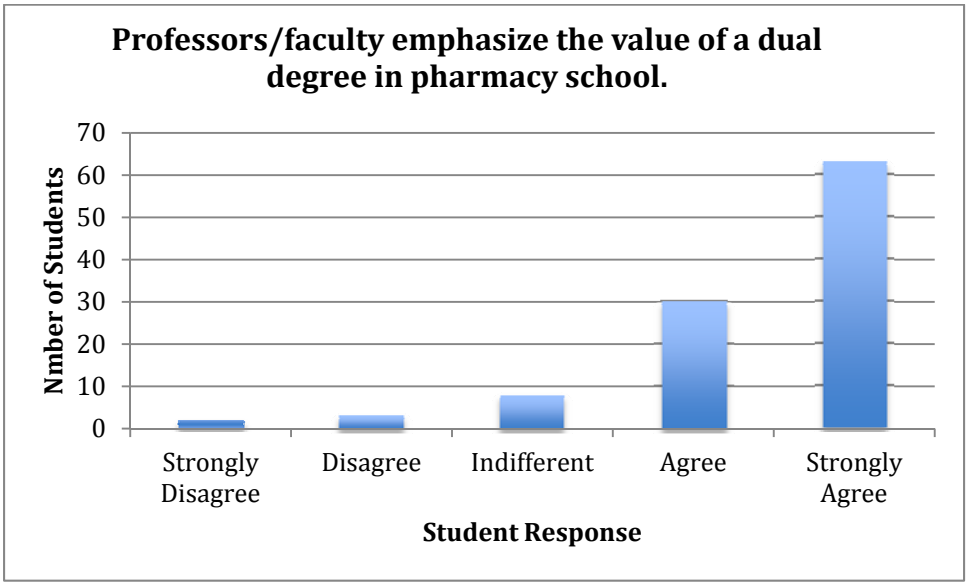


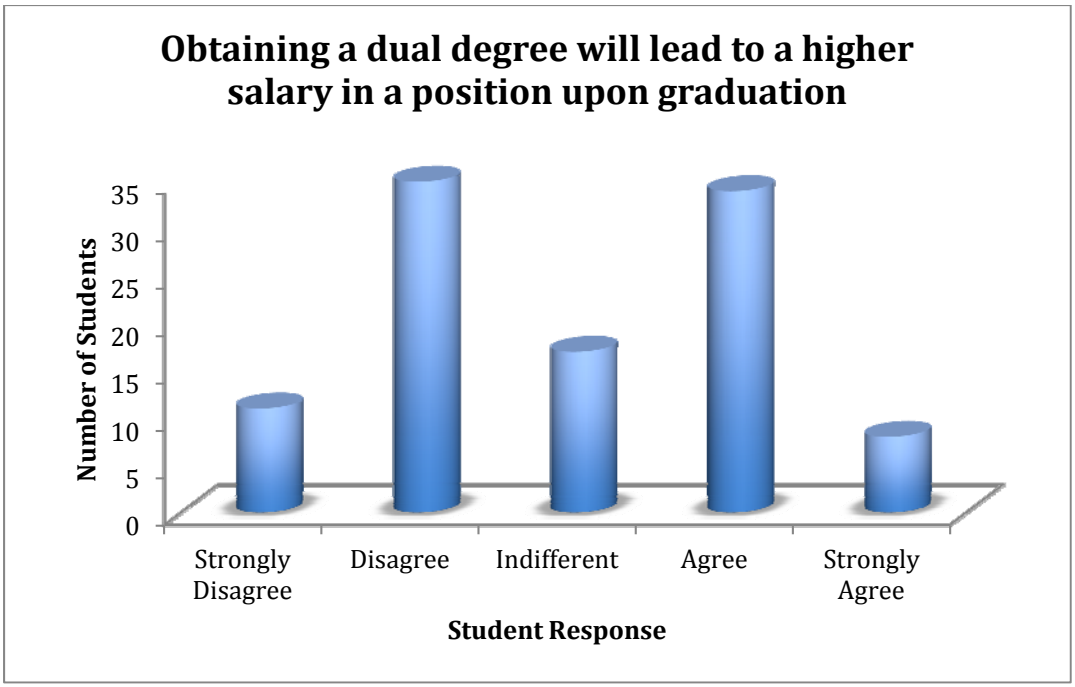


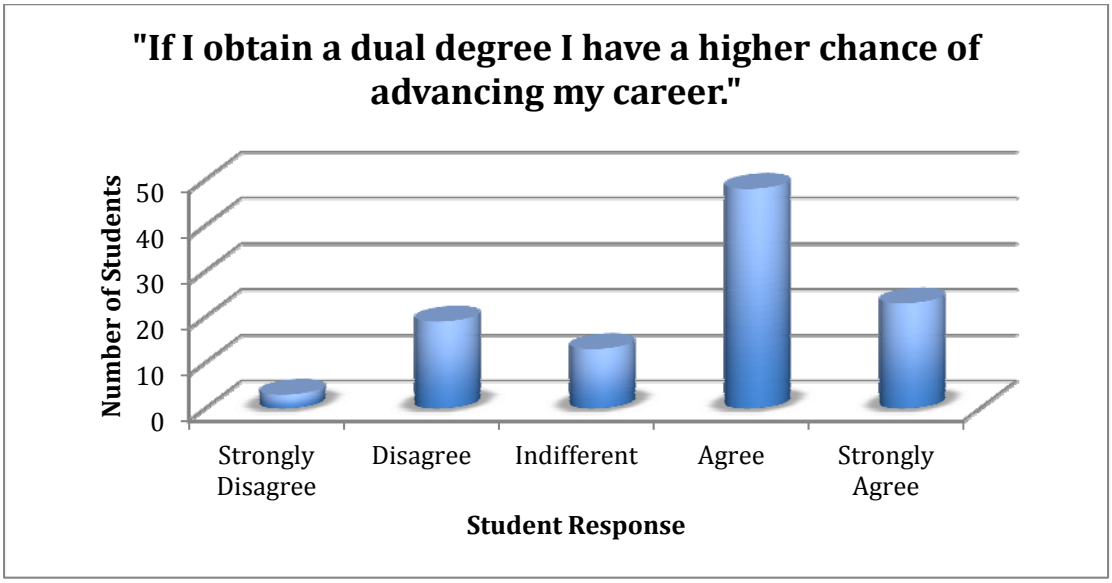
How many dual degree programs are offered at UK College of Pharmacy? **Correct answer is 4 programs.**

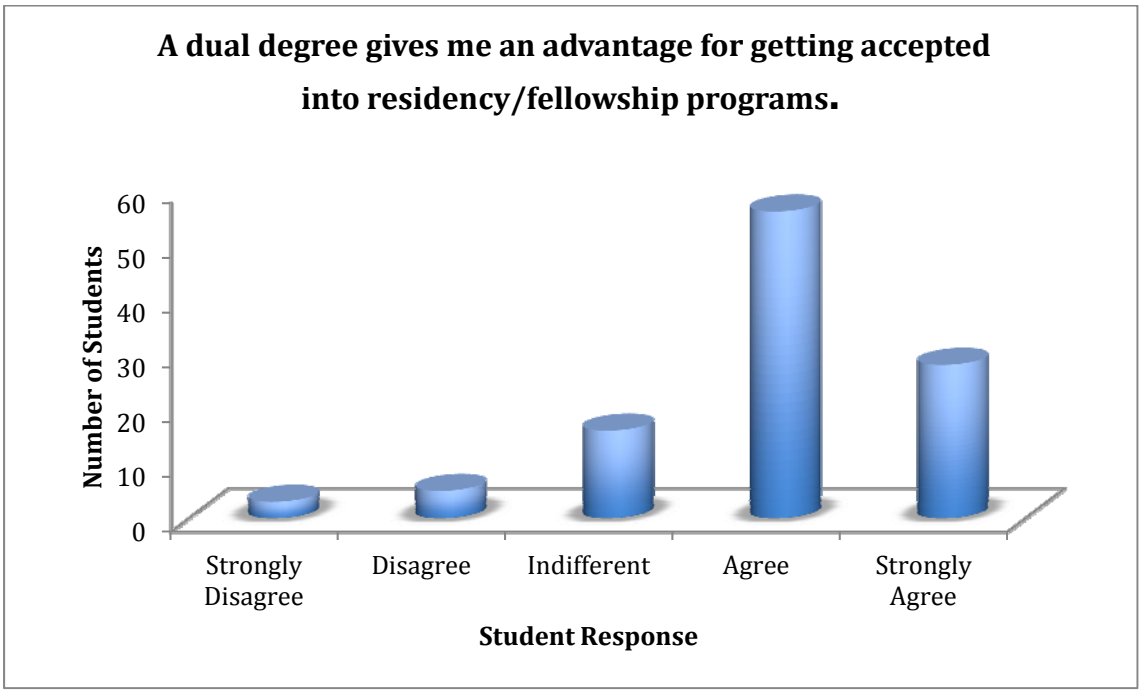


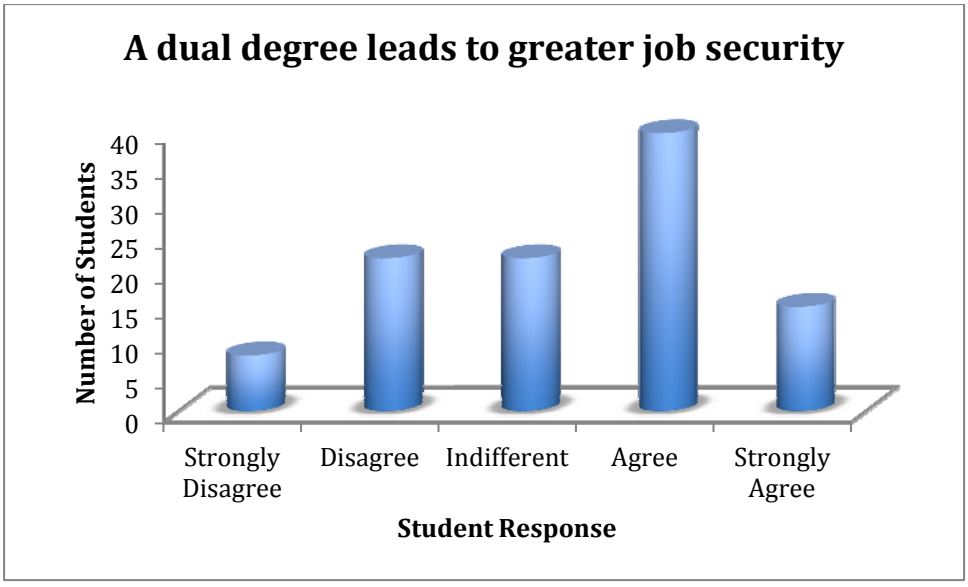

Which dual degree program are you planning to pursue?
Number of Students
80
70
60
50
40
30
20
10
0
PharmD/MBA
PharmD/MPA
PharmD/MPh
PharmD/MSPAS
None
Undecided
Student Response

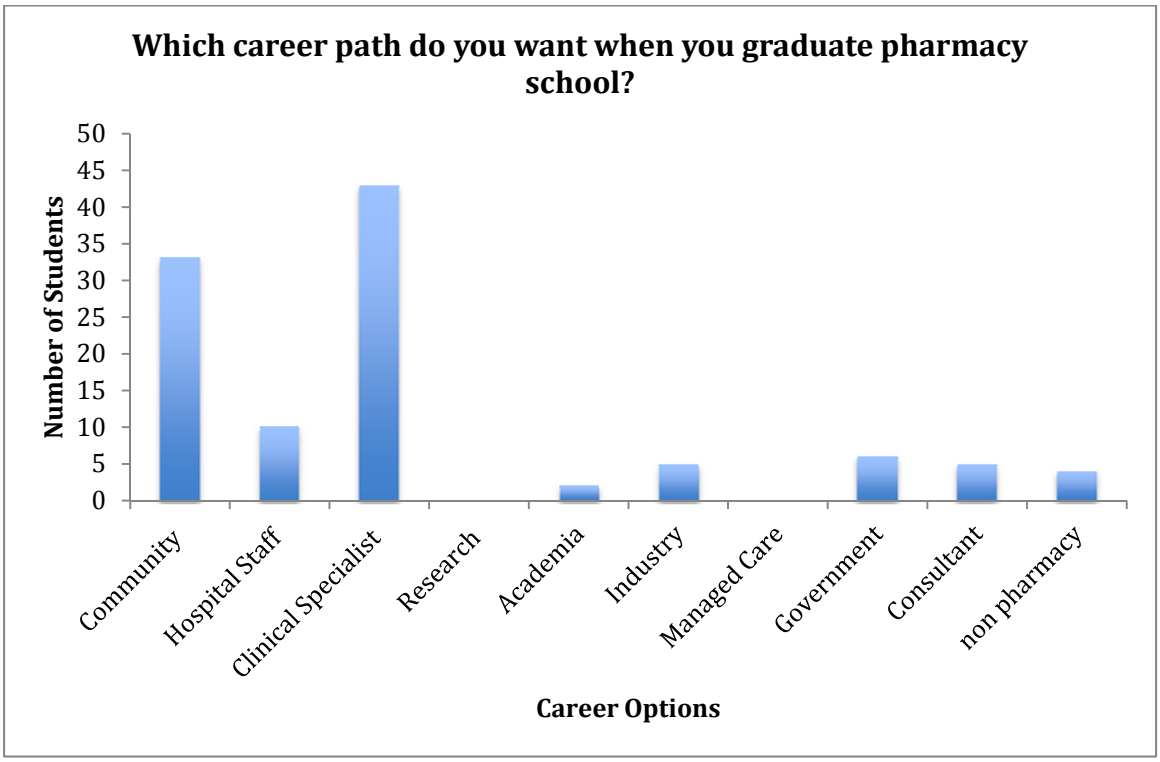

Professors/faculty emphasize the value of a dual degree in pharmacy school.
Nmber of Students
70
60
50
40
30
20
10
0
Strongly Disagree
Disagree
Indifferent
Agree
Strongly Agree
Student Response

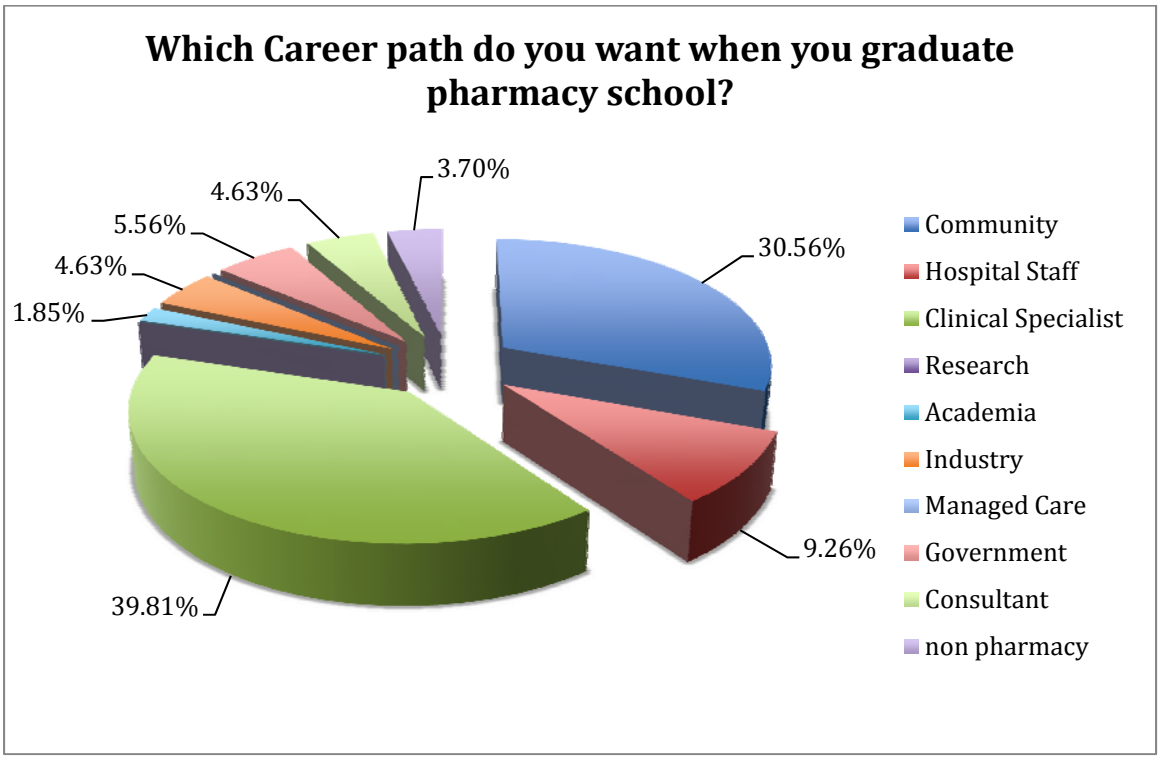

Obtaining a dual degree will lead to a higher salary in a position upon graduation
Number of Students
35
30
25
20
15
10
5
0
Strongly Disagree
Disagree
Indifferent
Agree
Strongly Agree
Student Response

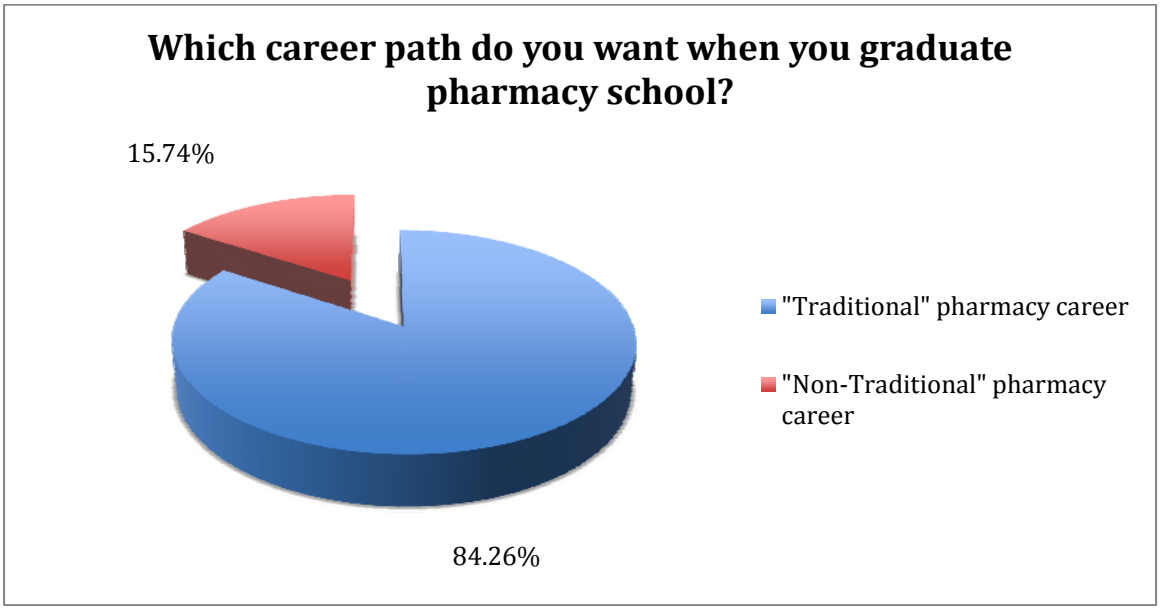

"If I obtain a dual degree I have a higher chance of advancing my career."
Number of Students
50
40
30
20
10
0
Strongly Disagree
Disagree
Indifferent
Agree
Strongly Agree
Student Response


A dual degree gives me an advantage for getting accepted into residency/fellowship programs.
Number of Students
60
50
40
30
20
10
0
Strongly Disagree
Disagree
Indifferent
Agree
Strongly Agree
Student Response


A dual degree leads to greater job security
Number of Students
40
35
30
25
20
15
10
5
0
Strongly Disagree
Disagree
Indifferent
Agree
Strongly Agree
Student Response

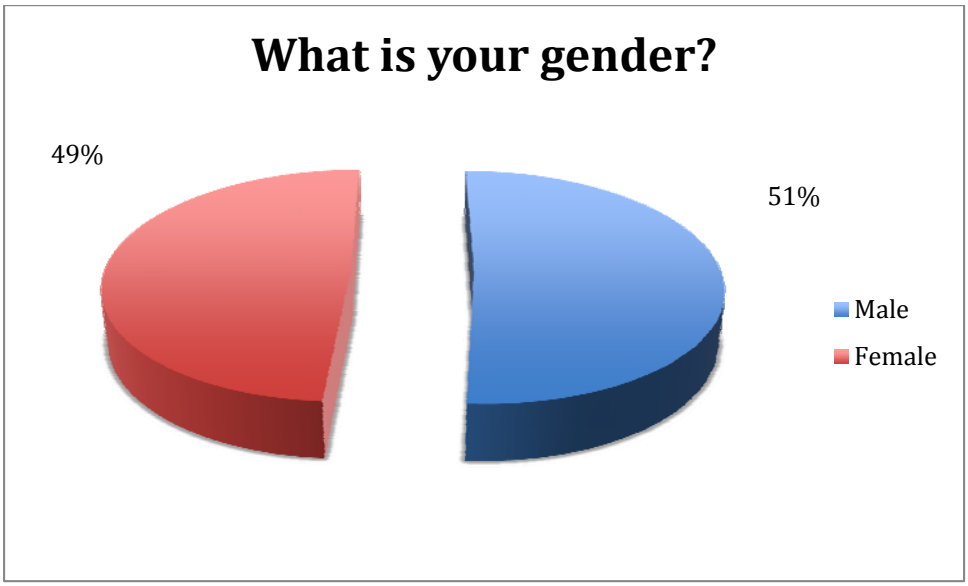

Which career path do you want when you graduate pharmacy school?
Number of Students
50
45
40
35
30
25
20
15
10
5
0
Community
Hospital Staff
Clinical Specialist
Research
Academia
Industry
Managed Care
Government
Consultant
non pharmacy
Career Options

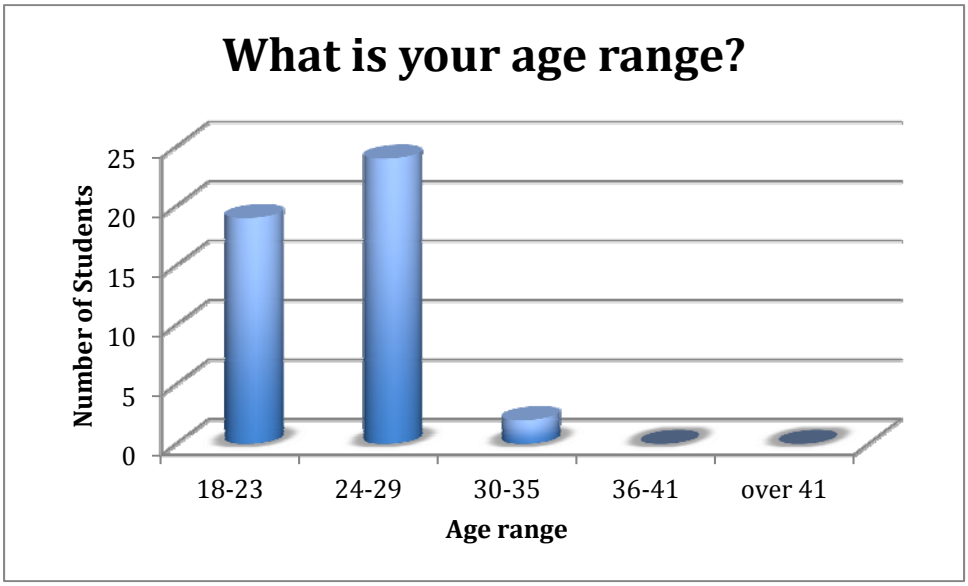

Which Career path do you want when you graduate pharmacy school?
3.70%
4.63%
5.56%
4.63%
1.85%
30.56%
9.26%
39.81%
Community
Hospital Staff
Clinical Specialist
Research
Academia
Industry
Managed Care
Government
Consultant
non pharmacy

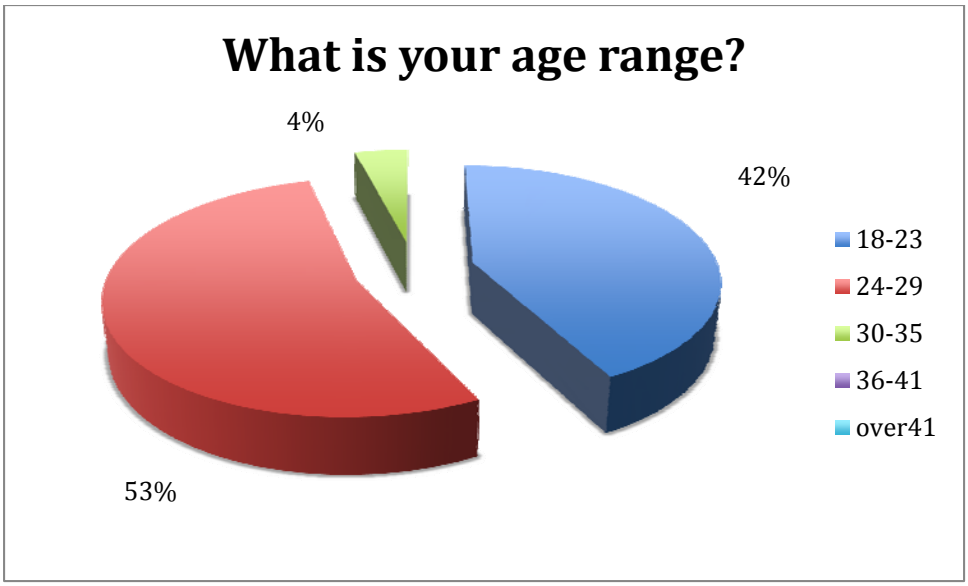

Which career path do you want when you graduate pharmacy school?
15.74%
84.26%
"Traditional" pharmacy career
"Non-Traditional" pharmacy career

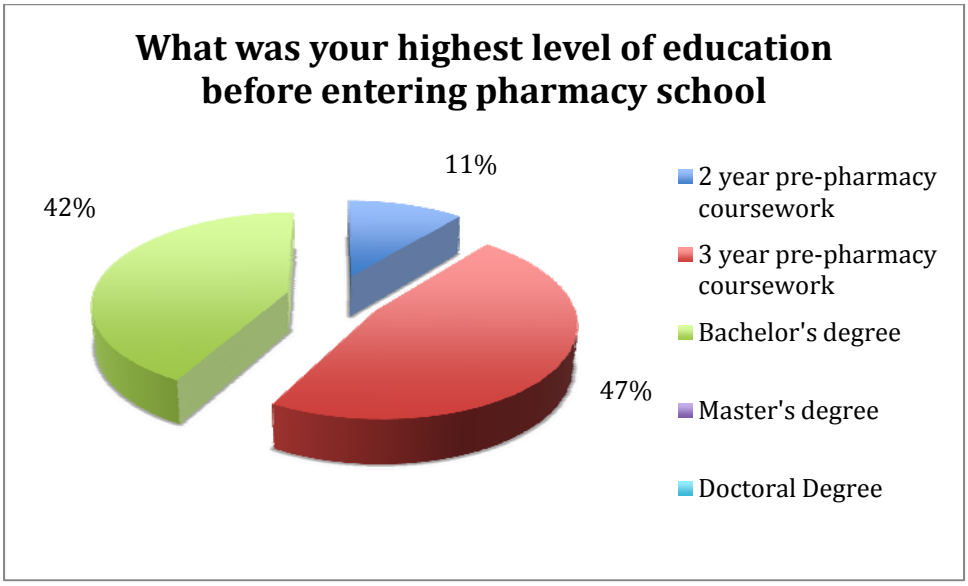
Appendix 4: Results from PY2-PY4 Dual Degree Students Survey

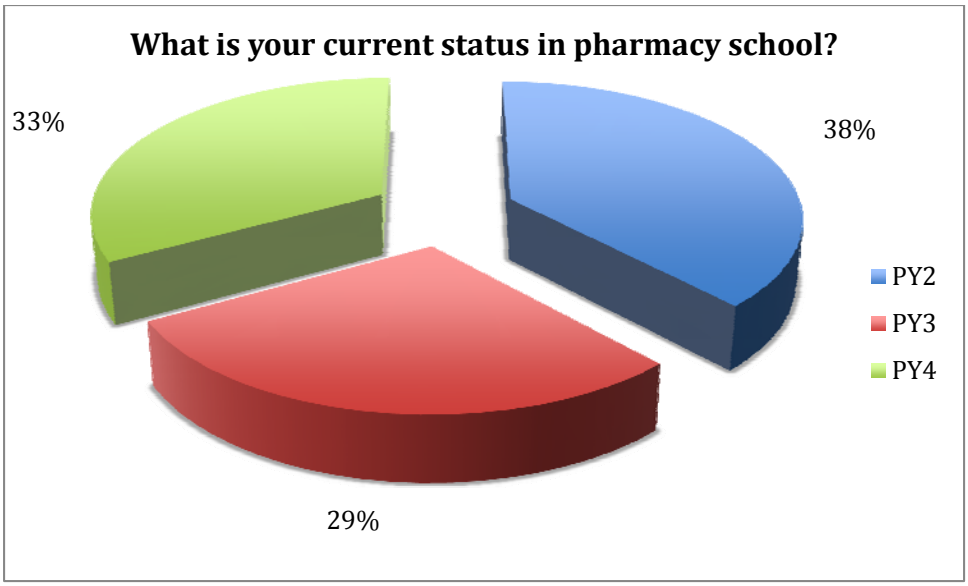
Response Rate: 73.7% (45 out of 61)
Note: 54 of the 60 were "active" dual degree students before survey, the other 6 dropped their respective dual degree program. However, I wanted to give them an opportunity for feedback.

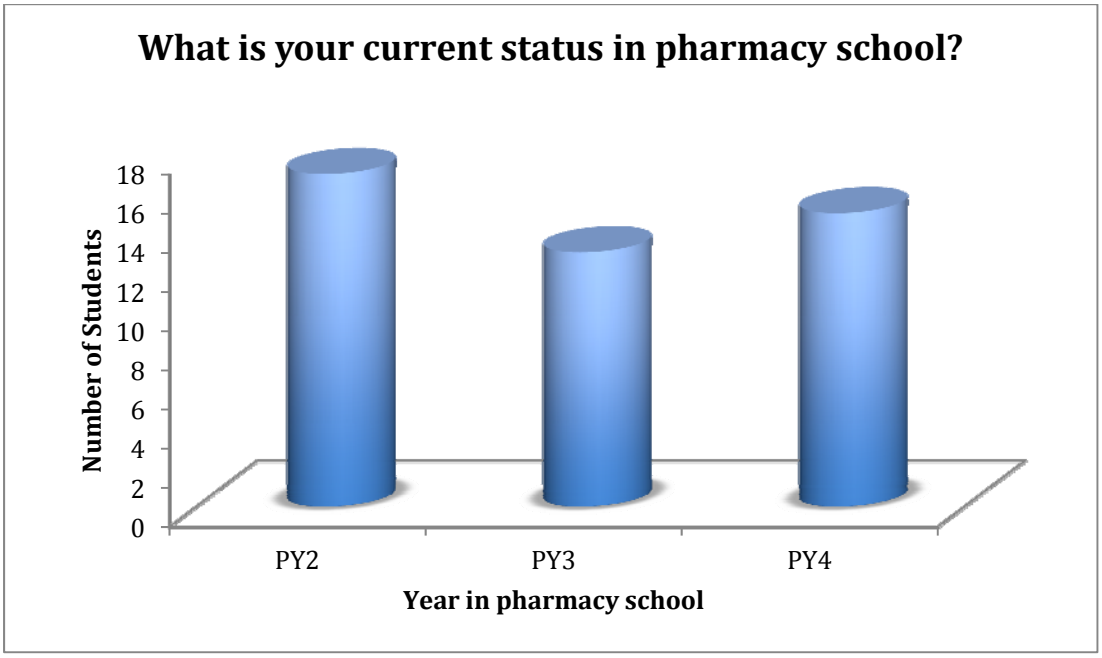


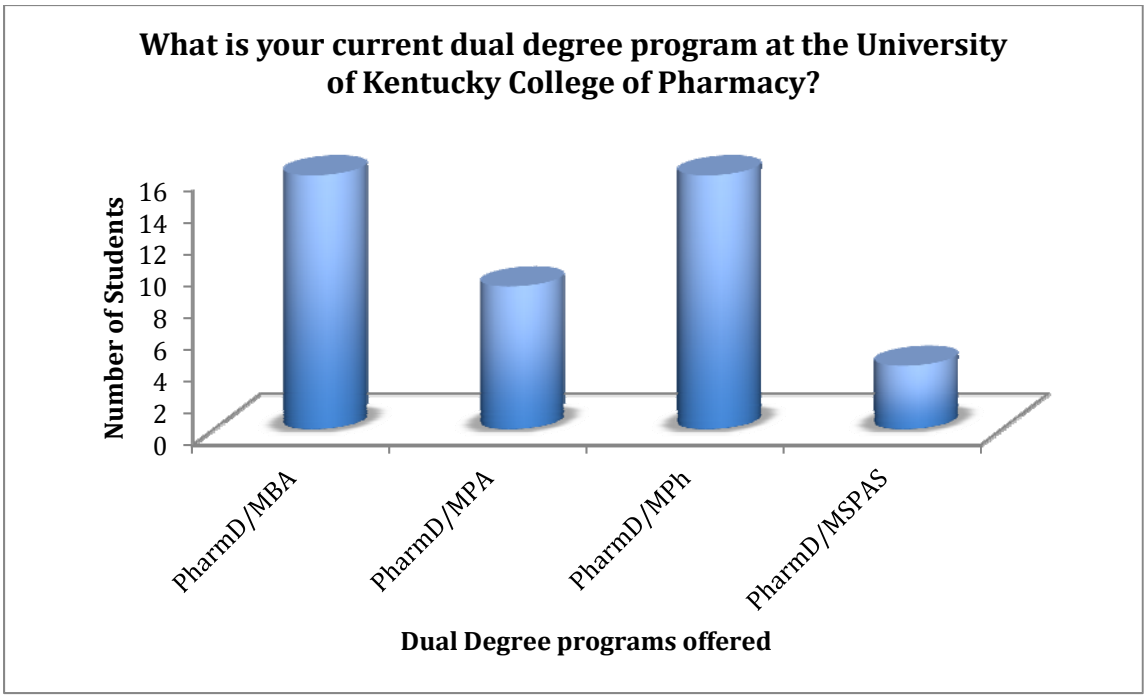


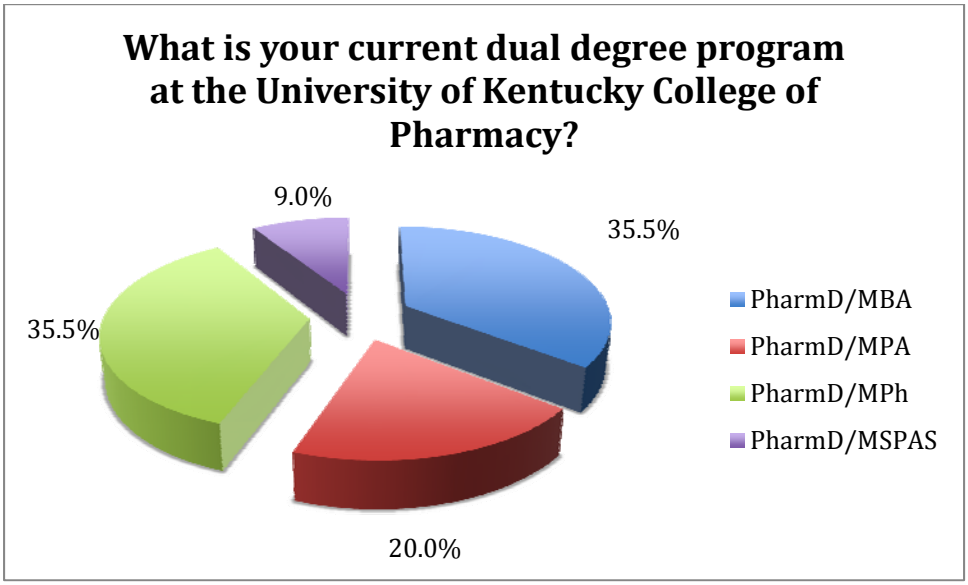

What is your age range?
4%
42%
53%
18-23
24-29
30-35
36-41
over41


What was your highest level of education before entering pharmacy school
11%
42%
47%
2 year pre-pharmacy coursework
3 year pre-pharmacy coursework
Bachelor's degree
Master's degree
Doctoral Degree

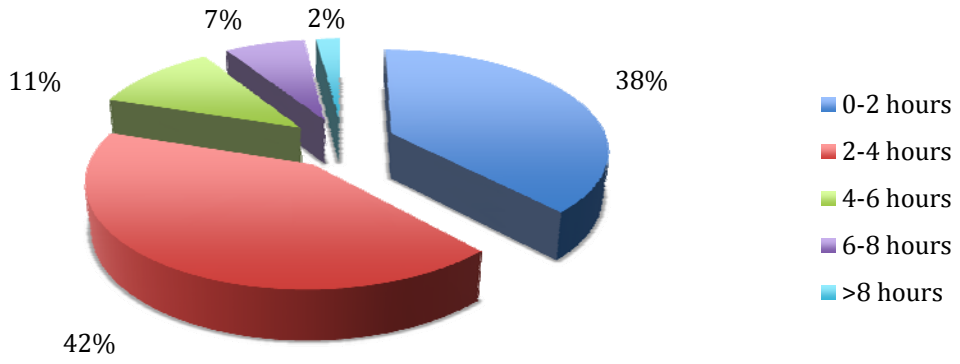

What is your current status in pharmacy school?
33%
38%
29%
PY2
PY3
PY4


What is your current status in pharmacy school?
Number of Students
18
16
14
12
10
8
6
4
2
0
PY2
PY3
PY4
Year in pharmacy school

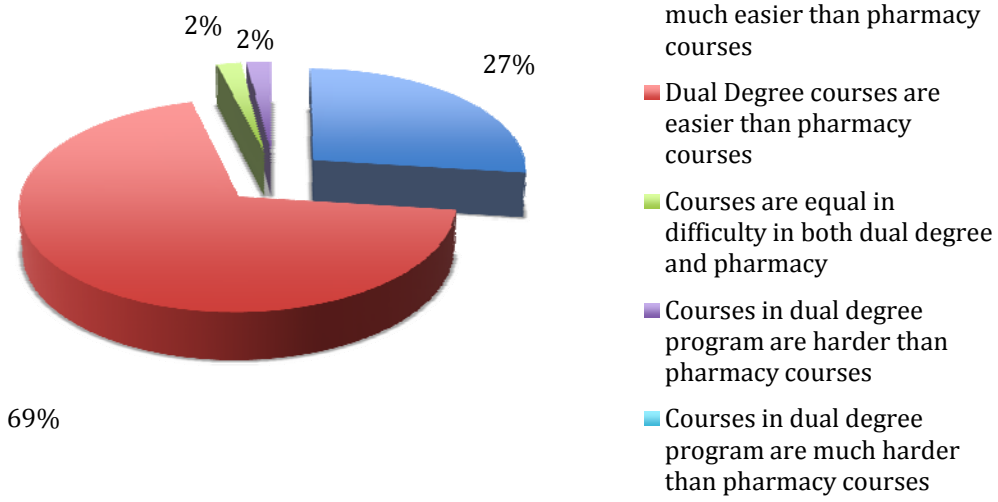

What is your current dual degree program at the University of Kentucky College of Pharmacy?
Number of Students
16
14
12
10
8
6
4
2
0
PharmD/MBA
PharmD/MPA
PharmD/MPh
PharmD/MSPAS
Dual Degree programs offered

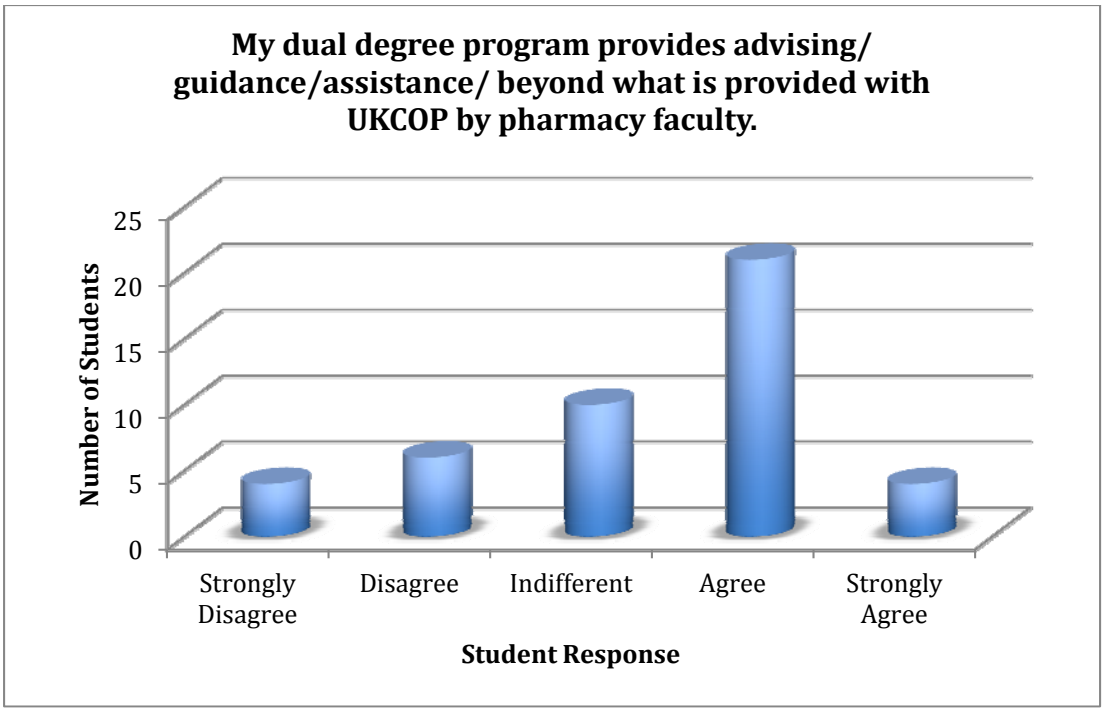

What is your current dual degree program at the University of Kentucky College of Pharmacy?
9.0%
35.5%
35.5%
20.0%
PharmD/MBA
PharmD/MPA
PharmD/MPh
PharmD/MSPAS

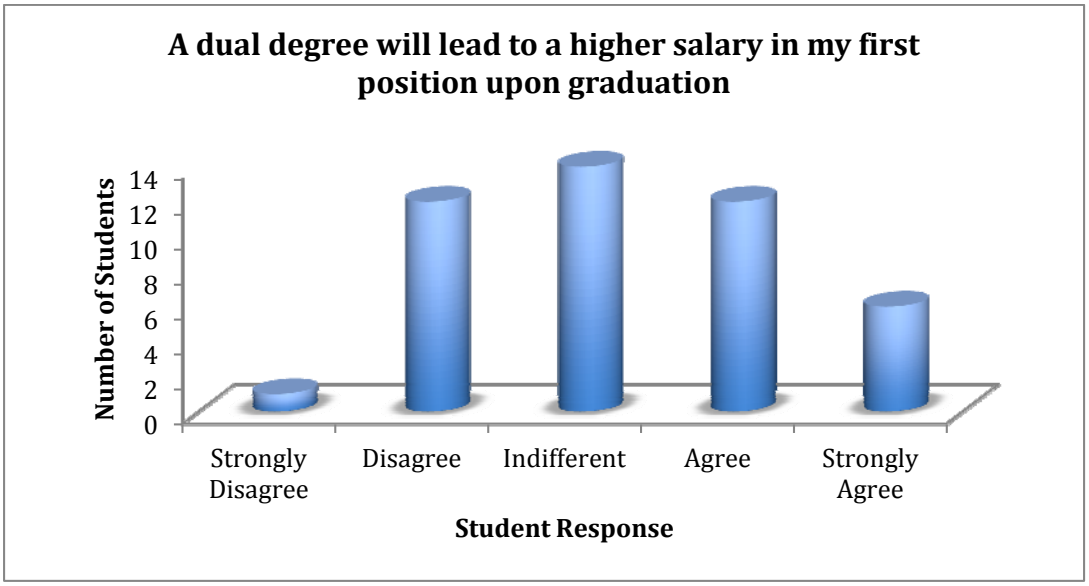
Hours spent in a week on dual program coursework only

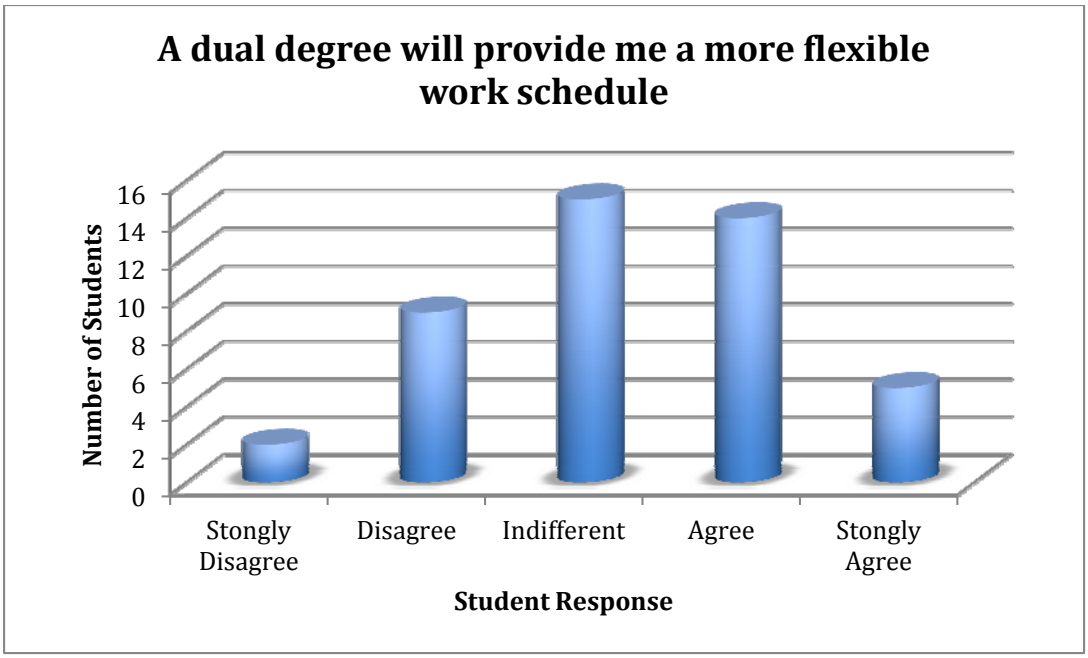


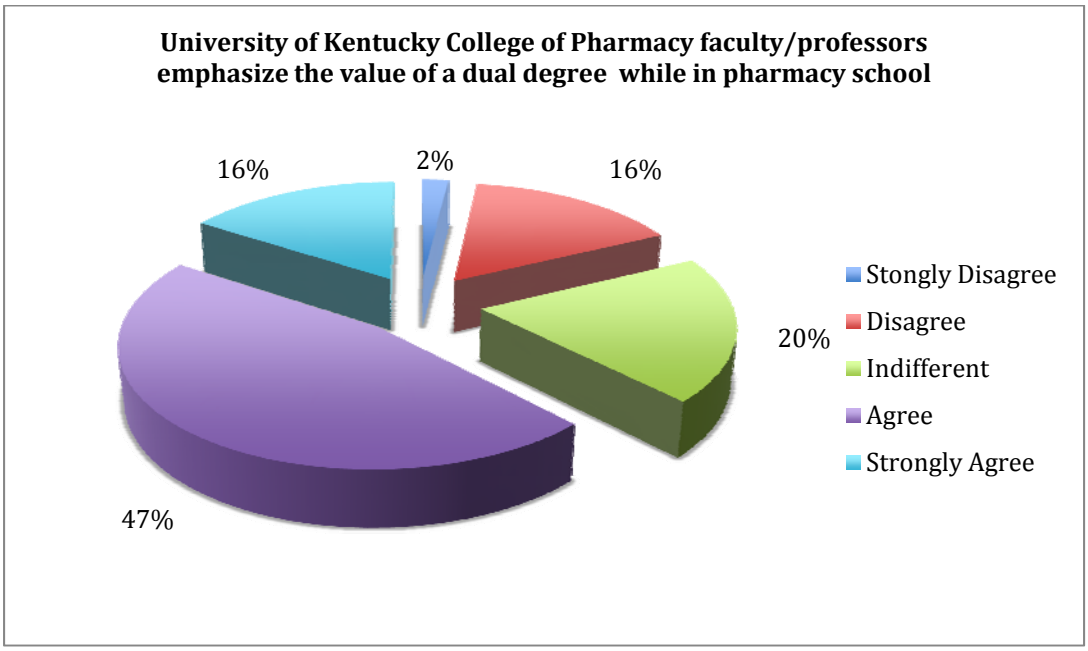
Difficulty of dual degree courses compared to pharmacy courses

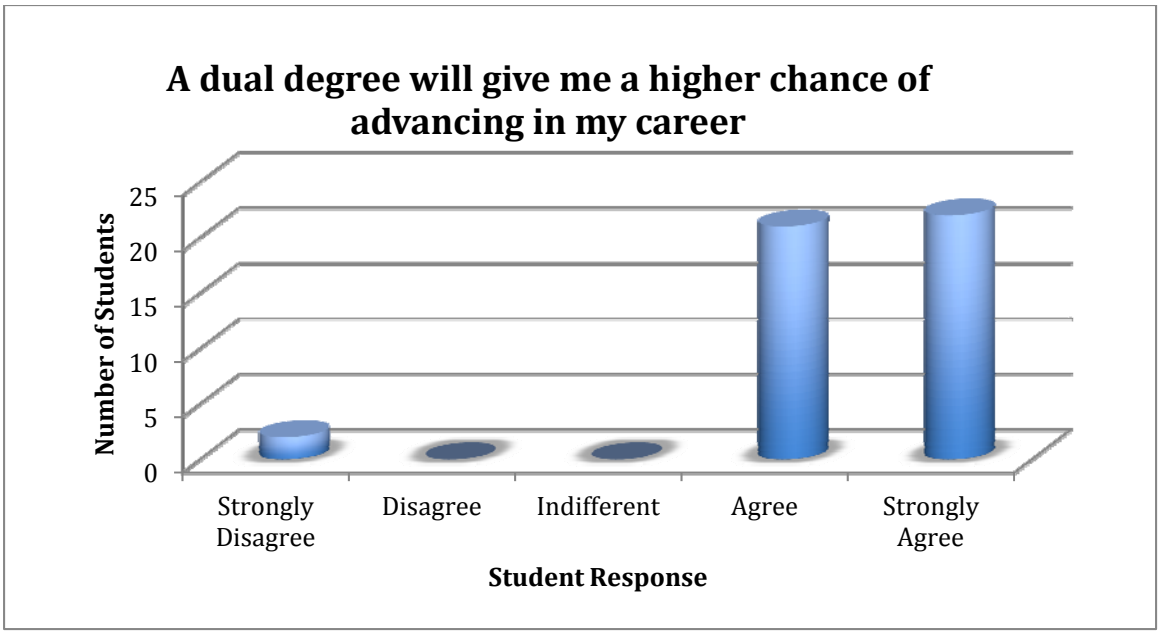


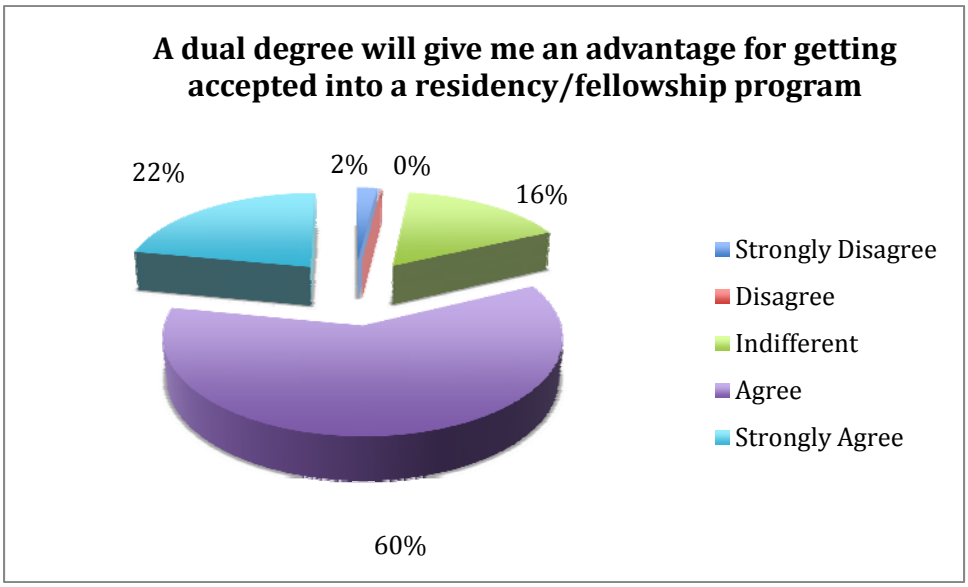

My dual degree program provides advising/ guidance/assistance/ beyond what is provided with UKCOP by pharmacy faculty.
Number of Students
25
20
15
10
5
0
Strongly Disagree
Disagree
Indifferent
Agree
Strongly Agree
Student Response

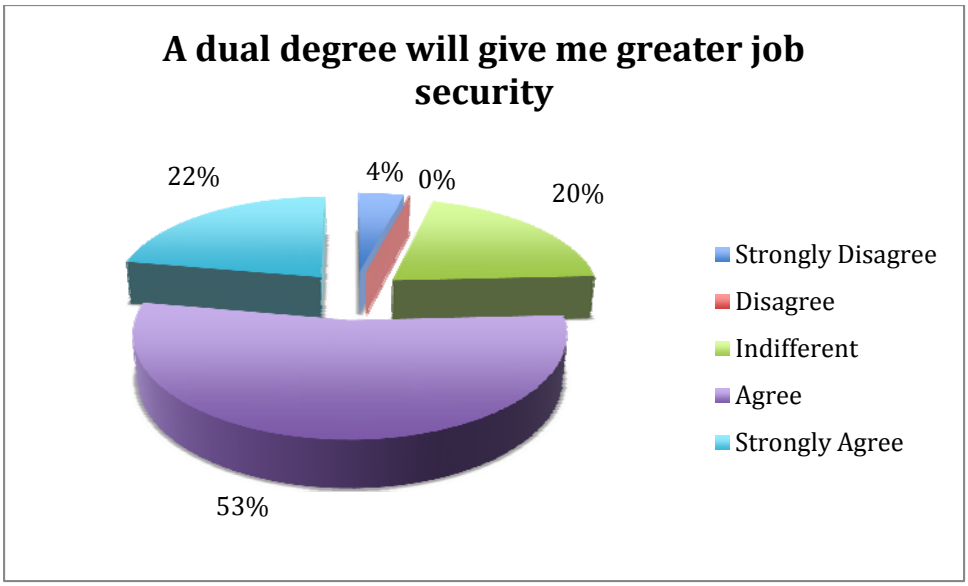

A dual degree will lead to a higher salary in my first position upon graduation
Number of Students
14
12
10
8
6
4
2
0
Strongly Disagree
Disagree
Indifferent
Agree
Strongly Agree
Student Response

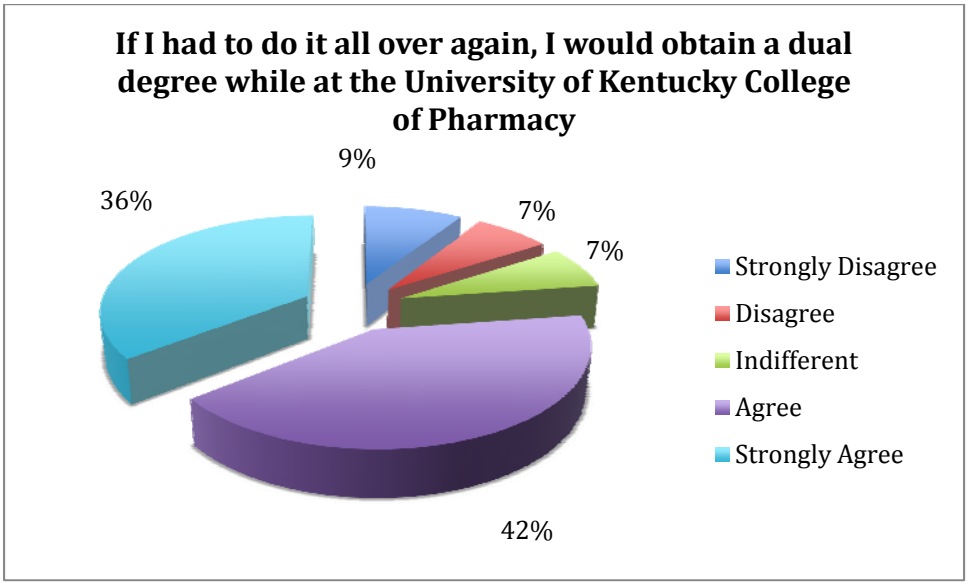

A dual degree will provide me a more flexible work schedule
Number of Students
16
14
12
10
8
6
4
2
0
Stongly Disagree
Disagree
Indifferent
Agree
Stongly Agree
Student Response

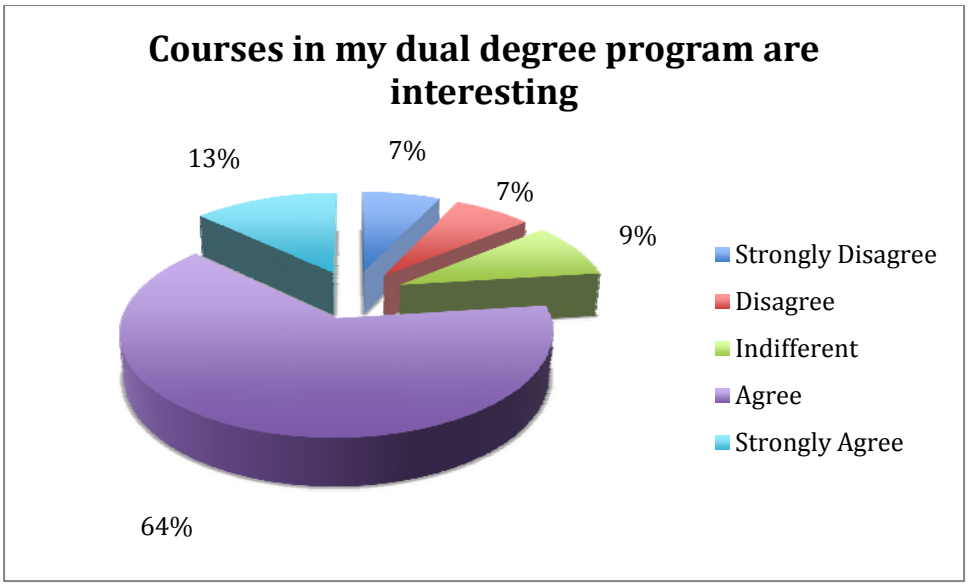

University of Kentucky College of Pharmacy faculty/professors emphasize the value of a dual degree while in pharmacy school
16%
2%
16%
20%
47%
Stongly Disagree
Disagree
Indifferent
Agree
Strongly Agree

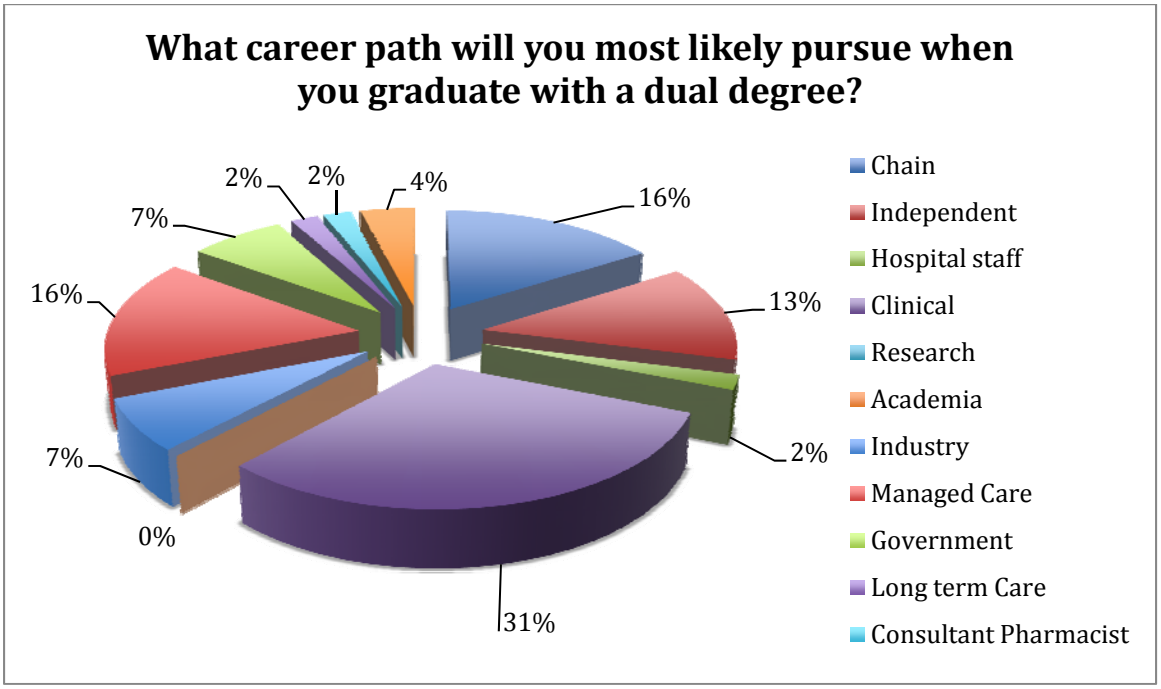

A dual degree will give me a higher chance of advancing in my career
Number of Students
25
20
15
10
5
0
Strongly Disagree
Disagree
Indifferent
Agree
Strongly Agree
Student Response

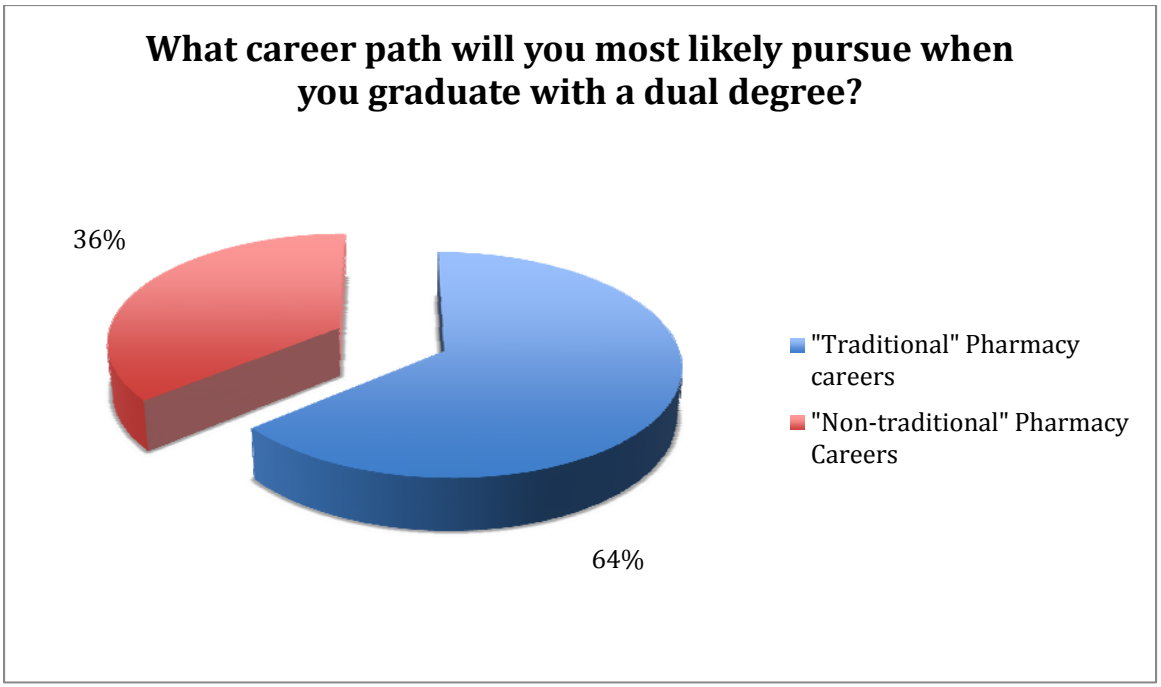

A dual degree will give me an advantage for getting accepted into a residency/fellowship program
22%
2%
0%
16%
60%
Strongly Disagree
Disagree
Indifferent
Agree
Strongly Agree

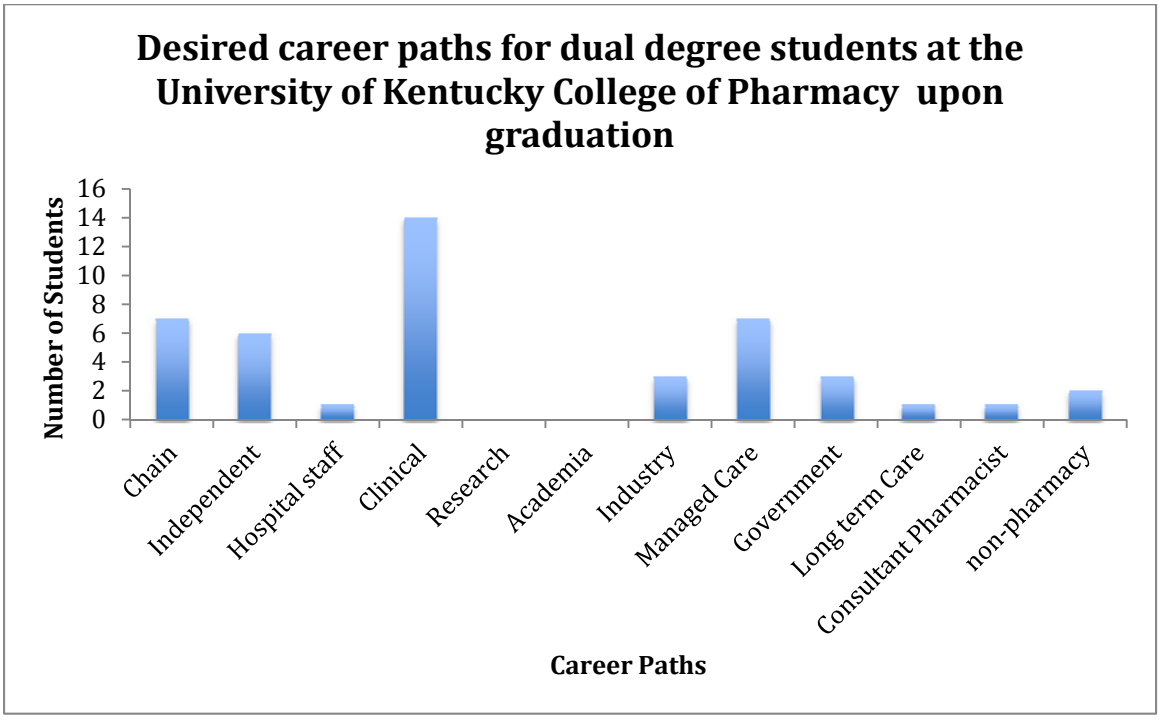

A dual degree will give me greater job security
22%
4%
0%
20%
53%
Strongly Disagree
Disagree
Indifferent
Agree
Strongly Agree


If I had to do it all over again, I would obtain a dual degree while at the University of Kentucky College of Pharmacy
9%
36%
7%
7%
42%
Strongly Disagree
Disagree
Indifferent
Agree
Strongly Agree


Courses in my dual degree program are interesting
13%
7%
7%
9%
64%
Strongly Disagree
Disagree
Indifferent
Agree
Strongly Agree


What career path will you most likely pursue when you graduate with a dual degree?
2%
2%
4%
16%
7%
16%
13%
7%
2%
0%
31%
Chain
Independent
Hospital staff
Clinical
Research
Academia
Industry
Managed Care
Government
Long term Care
Consultant Pharmacist


What career path will you most likely pursue when you graduate with a dual degree?
36%
64%
"Traditional" Pharmacy careers
"Non-traditional" Pharmacy Careers


Desired career paths for dual degree students at the University of Kentucky College of Pharmacy upon graduation
Number of Students
16
14
12
10
8
6
4
2
0
Chain
Independent
Hospital staff
Clinical
Research
Academia
Industry
Managed Care
Government
Long term Care
Consultant Pharmacist
non-pharmacy
Career Paths

Appendix 5: Logistic Regression

Logistic Regression Model 1

Model Information	
Data Set	WORK.KAREN
Response Variable	Job
Number of Response Levels	2
Model	binary logit
Optimization Technique	Fisher's scoring

Number of Observations Read	316
Number of Observations Used	316

Response Profile		
Ordered Value	**Job**	**Total Frequency**
1	1	103
2	0	213

Probability modeled is Job=1.

Class Level Information				
Class	**Value**	**Design Variables**		
Year	**2009**	0	0	
	2010	1	0	
	2011	0	1	
Age	**0**	0	0	0
	1	1	0	0
	2	0	1	0
	3	0	0	1

Class Level Information					
Class	**Value**	**Design Variables**			
Pre_pharmacy_degrees	**0**	0	0		
	1	1	0		
	2	0	1		
Career_advice	**0**	1	0	0	0
	1	0	0	0	0
	2	0	1	0	0
	3	0	0	1	0
	4	0	0	0	1
Research	**0**	1	0	0	0
	1	0	0	0	0
	2	0	1	0	0
	3	0	0	1	0
	4	0	0	0	1
Choose_Pharmacy_Again	**0**	1	0	0	0
	1	0	0	0	0
	2	0	1	0	0
	3	0	0	1	0
	4	0	0	0	1

Model Convergence Status
Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	400.964	409.092
SC	404.720	495.474
-2 Log L	398.964	363.092

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	35.8729	22	0.0313
Score	33.2239	22	0.0588
Wald	29.3964	22	0.1339

Type 3 Analysis of Effects			
Effect	**DF**	**Wald Chi-Square**	**Pr > ChiSq**
Year	2	6.7313	0.0345
Gender	1	1.7220	0.1894
Age	3	3.2579	0.3535
Pre_pharmacy_degrees	2	1.2385	0.5384
Dual_Degree	1	3.6187	0.0571
Debt_	1	2.2378	0.1347
Career_advice	4	11.1251	0.0252
Research	4	2.4293	0.6573
Choose_Pharmacy_Agai	4	2.2002	0.6990

Analysis of Maximum Likelihood Estimates						
Parameter		**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept		1	-0.6874	0.4491	2.3422	0.1259
Year	**2010**	1	0.8125	0.3245	6.2681	0.0123
Year	**2011**	1	0.2263	0.3370	0.4508	0.5019
Gender		1	-0.3561	0.2713	1.7220	0.1894
Age	**1**	1	-0.6304	0.3768	2.8000	0.0943
Age	**2**	1	-0.9779	0.8616	1.2881	0.2564
Age	**3**	1	-0.5622	0.7997	0.4941	0.4821
Pre_pharmacy_degrees	**1**	1	-0.0374	0.3603	0.0108	0.9173
Pre_pharmacy_degrees	**2**	1	0.9092	0.8877	1.0492	0.3057
Dual_Degree		1	0.8884	0.4670	3.6187	0.0571
Debt_		1	-3.67E-6	2.45E-6	2.2378	0.1347
Career_advice	**0**	1	0.8218	0.4501	3.3329	0.0679
Career_advice	**2**	1	0.6142	0.4074	2.2725	0.1317
Career_advice	**3**	1	-0.4840	0.5862	0.6817	0.4090
Career_advice	**4**	1	-1.0562	0.9641	1.2001	0.2733
Research	**0**	1	0.7732	0.9134	0.7165	0.3973
Research	**2**	1	-0.1400	0.3331	0.1767	0.6742
Research	**3**	1	-0.6049	0.5223	1.3416	0.2467
Research	**4**	1	0.1678	1.0866	0.0239	0.8773
Choose_Pharmacy_Agai	**0**	1	0.5510	0.7891	0.4875	0.4851
Choose_Pharmacy_Agai	**2**	1	-0.0601	0.3167	0.0360	0.8495
Choose_Pharmacy_Agai	**3**	1	0.3465	0.5229	0.4391	0.5076
Choose_Pharmacy_Agai	**4**	1	0.8226	0.7870	1.0925	0.2959

Odds Ratio Estimates			
Effect	**Point Estimate**	**95% Wald Confidence Limits**	
Year 2010 vs 2009	2.254	1.193	4.257
Year 2011 vs 2009	1.254	0.648	2.427
Gender	0.700	0.412	1.192
Age 1 vs 0	0.532	0.254	1.114
Age 2 vs 0	0.376	0.069	2.036
Age 3 vs 0	0.570	0.119	2.733
Pre_pharmacy_degrees 1 vs 0	0.963	0.475	1.952
Pre_pharmacy_degrees 2 vs 0	2.482	0.436	14.140
Dual_Degree	2.431	0.973	6.072
Debt_	1.000	1.000	1.000
Career_advice 0 vs 1	2.275	0.941	5.496
Career_advice 2 vs 1	1.848	0.832	4.107
Career_advice 3 vs 1	0.616	0.195	1.944
Career_advice 4 vs 1	0.348	0.053	2.301
Research 0 vs 1	2.167	0.362	12.980
Research 2 vs 1	0.869	0.453	1.670
Research 3 vs 1	0.546	0.196	1.520
Research 4 vs 1	1.183	0.141	9.949
Choose_Pharmacy_Agai 0 vs 1	1.735	0.369	8.147
Choose_Pharmacy_Agai 2 vs 1	0.942	0.506	1.752
Choose_Pharmacy_Agai 3 vs 1	1.414	0.507	3.940
Choose_Pharmacy_Agai 4 vs 1	2.276	0.487	10.645

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	69.0	**Somers' D**	0.384
Percent Discordant	30.6	**Gamma**	0.385
Percent Tied	0.3	**Tau-a**	0.169

Association of Predicted Probabilities and Observed Responses			
Pairs	21939	**c**	0.692

Odds Ratio Estimates and Wald Confidence Intervals				
Effect	**Unit**	**Estimate**	**95% Confidence Limits**	
Debt_	1000.0	0.996	0.992	1.001
Debt_	10000.0	0.964	0.919	1.011
Debt_	50000.0	0.833	0.655	1.058

Logistic regression-Model 2

The LOGISTIC Procedure

Model Information	
Data Set	WORK.KAREN
Response Variable	Job
Number of Response Levels	2
Model	binary logit
Optimization Technique	Fisher's scoring

Number of Observations Read	316
Number of Observations Used	316

Response Profile		
Ordered Value	**Job**	**Total Frequency**
1	1	103
2	0	213

Probability modeled is Job=1.

Class Level Information				
Class	**Value**	**Design Variables**		
Year	**2009**	0	0	
	2010	1	0	
	2011	0	1	
Age	**0**	0	0	0
	1	1	0	0
	2	0	1	0
	3	0	0	1
Pre_pharmacy_degrees	**0**	0	0	
	1	1	0	
	2	0	1	
career_advice_ind	**0**	1	0	0
	1	0	0	0
	2	0	1	0
	3	0	0	1
research_ind	**0**	1	0	0
	1	0	0	0
	2	0	1	0
	3	0	0	1
choose_pharmacy_again_ind	**0**	1	0	0
	1	0	0	0
	2	0	1	0
	3	0	0	1

Model Convergence Status
Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics		
Criterion	**Intercept Only**	**Intercept and Covariates**
AIC	400.964	404.092
SC	404.720	479.207
-2 Log L	398.964	364.092

Testing Global Null Hypothesis: BETA=0			
Test	**Chi-Square**	**DF**	**Pr > ChiSq**
Likelihood Ratio	34.8720	19	0.0145
Score	32.3622	19	0.0284
Wald	28.8265	19	0.0688

Type 3 Analysis of Effects			
Effect	**DF**	**Wald Chi-Square**	**Pr > ChiSq**
Year	2	6.8415	0.0327
Gender	1	2.1387	0.1436
Age	3	3.3649	0.3387
Pre_pharmacy_degrees	2	1.1404	0.5654
Dual_Degree	1	3.7779	0.0519
Debt_	1	1.9313	0.1646
career_advice_ind	3	10.9552	0.0120
research_ind	3	2.1958	0.5328
choose_pharmacy_agai	3	1.8430	0.6056

Analysis of Maximum Likelihood Estimates						
Parameter		**DF**	**Estimate**	**Standard Error**	**Wald Chi-Square**	**Pr > ChiSq**
Intercept		1	-0.6922	0.4478	2.3895	0.1222
Year	**2010**	1	0.8194	0.3242	6.3876	0.0115
Year	**2011**	1	0.2316	0.3351	0.4775	0.4896
Gender		1	-0.3919	0.2680	2.1387	0.1436
Age	**1**	1	-0.6248	0.3714	2.8297	0.0925
Age	**2**	1	-1.0159	0.8607	1.3930	0.2379
Age	**3**	1	-0.6211	0.7983	0.6053	0.4366
Pre_pharmacy_degrees	**1**	1	-0.0475	0.3586	0.0176	0.8945
Pre_pharmacy_degrees	**2**	1	0.8586	0.8851	0.9409	0.3321
Dual_Degree		1	0.9045	0.4653	3.7779	0.0519
Debt_		1	-3.34E-6	2.402E-6	1.9313	0.1646
career_advice_ind	**0**	1	0.8252	0.4486	3.3844	0.0658
career_advice_ind	**2**	1	0.6392	0.4051	2.4891	0.1146
career_advice_ind	**3**	1	-0.5822	0.5444	1.1436	0.2849
research_ind	**0**	1	0.7141	0.9058	0.6215	0.4305
research_ind	**2**	1	-0.1418	0.3301	0.1846	0.6675
research_ind	**3**	1	-0.5363	0.4750	1.2748	0.2589
choose_pharmacy_agai	**0**	1	0.5153	0.7891	0.4264	0.5138
choose_pharmacy_agai	**2**	1	-0.0792	0.3126	0.0641	0.8001
choose_pharmacy_agai	**3**	1	0.4520	0.4561	0.9821	0.3217

Odds Ratio Estimates			
Effect	**Point Estimate**	**95% Wald Confidence Limits**	
Year 2010 vs 2009	2.269	1.202	4.284
Year 2011 vs 2009	1.261	0.654	2.431
Gender	0.676	0.400	1.143
Age 1 vs 0	0.535	0.259	1.109
Age 2 vs 0	0.362	0.067	1.956
Age 3 vs 0	0.537	0.112	2.569
Pre_pharmacy_degrees 1 vs 0	0.954	0.472	1.926
Pre_pharmacy_degrees 2 vs 0	2.360	0.416	13.375
Dual_Degree	2.471	0.992	6.151
Debt_	1.000	1.000	1.000
career_advice_ind 0 vs 1	2.282	0.947	5.498
career_advice_ind 2 vs 1	1.895	0.857	4.192
career_advice_ind 3 vs 1	0.559	0.192	1.624
research_ind 0 vs 1	2.042	0.346	12.056
research_ind 2 vs 1	0.868	0.454	1.657
research_ind 3 vs 1	0.585	0.231	1.484
choose_pharmacy_agai 0 vs 1	1.674	0.357	7.861
choose_pharmacy_agai 2 vs 1	0.924	0.501	1.705
choose_pharmacy_agai 3 vs 1	1.571	0.643	3.842

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	69.3	**Somers' D**	0.390
Percent Discordant	30.3	**Gamma**	0.391
Percent Tied	0.4	**Tau-a**	0.172
Pairs	21939	**c**	0.695

Odds Ratio Estimates and Wald Confidence Intervals				
Effect	**Unit**	**Estimate**	**95% Confidence Limits**	
Debt_	1000.0	0.997	0.992	1.001
Debt_	10000.0	0.967	0.923	1.014
Debt_	50000.0	0.846	0.669	1.071