

# Exploring the Crystallization, Specification, and Implementation Stage in Early Career Development of Legal Management Graduates Through Gaussian Mix Model (GMM)

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## ABSTRACT

This study focuses on newly graduated legal management students' career development processes within the Developmental Self-Concept Theory proposed by Donald Super, particularly on three sub-stages: Crystallization, Specification, and Implementation. This research reveals how GMM clustering and descriptive statistics identify distinct patterns among these graduates when approaching early career paths. The results indicate that most graduates are at the crystallization stage, exploring different career options and beginning by identifying their interests and skills. A smaller proportion has moved to the specification and implementation stages, where they narrow down their choices of careers and apply their skills. The recommendations made by the research include increased career counseling, skill development programs, and networking at all career development phases of the graduates to enable their successful transition from the academic environment to the professional workforce.

**Keywords:** Early Career Development Sub-stages, Gaussian Mix Model, Legal Management Graduates, UNSDG No. 4

## INTRODUCTION

Business graduates face some unique challenges in their career development stages, as well as the impacts that these have on their careers. Donald Super's Developmental Self-Concept Theory identifies these as five stages in career development: growth, exploration, establishment, maintenance, and decline (Super, 1969). Here is a summary of these critical issues and statistics. The Growth stage between childhood and adolescence is when an individual acquires self-concept and career aspirations. Career exploration is a challenge, and most business graduates need to understand how many career opportunities exist in the business world. A survey only found that 37% of high school students accessed career counseling services—this barred them from making good choices on careers they wanted to pursue later in life (Conlon, n.d.). The following exploration is during this exploration phase, and young adults actively seek to understand their career options. This sometimes makes it difficult for business graduates to obtain relevant experience because 56% of employers report that recent graduates cannot acquire entry skills (Mainga et al., 2022). Internships may be a cushion, but only 43% of students participate in internships as undergraduates (Ho et al., 2022). The Establishment phase of transition into the first professional job remains crucial during the establishment stage for any graduate. However, 41% of new grads are underemployed and employed in jobs that do not require a college degree (Career Services, 2014). This likely limits the advancement and satisfaction one can realize through their work.

In the Maintenance stage, one works to sustain an established career. Business graduates could not keep up with role change as 65% of the jobs created in 2030 will require skills workers do not currently have (Sakamoto & Sung, n.d.). Competencies need to be sustained through constant learning and knowledge gathering. When an Individual expects the decline stage, the person is more than ready to retire or perform less demanding work. Adequate, rewarding, meaningful opportunities may be scarce for a graduate in business and related functions.

According to a recent survey, 45% of those 55 or older consider postponing retirement out of financial need (Anjum, 2020). To better respond to these challenges, business graduates must be proactive regarding career development by availing themselves of mentorship, networking opportunities, and professional development. Additionally, graduate employability and positive contributions include career services, skills-based curricula, and collaborations between higher education institutions and employers (Conlon, n.d.), (Mainga et al., 2022).

Most new college graduates are in the exploration stage, which is the period from mid-teens to mid-20s when the elements of trial and error in career options are at their peak. Business graduates face saturation in the job market and excessive competition, especially in the more lucrative finance and marketing sectors. A 2022 Graduate Management Admission Council survey showed that 39% of business graduates indicated difficulty finding appropriate employment for their interests and skill levels within six months of graduation (Corporate Recruiters Survey, 2022). Many others need help with underemployment, where they do not have a role utilizing the educational background or potential obtained, which also leads to dissatisfaction and job turnover (Aguiar do Monte, 2012).

The research aligns with U.N. Sustainable Development Goal 4: Quality Education. It contributes toward this goal by investigating the factors that affect career development in legal management graduates in a way that potentially contributes relevant information to educational institutions and other policymakers on how best to develop curricula and programs for effectively equipping students to succeed in professional careers. The research further tries to grasp the career paths for these graduates and the challenges to keeping legal management education relevant and in line with labor market requirements, contributing to the overall development of people and societies.

The primary objective of this study was to investigate and analyze the career development patterns of B.S. Legal Management graduates who completed their degree in the last 3 to 5 years. The study aims to identify and characterize specific work processes and experiences, specifically Donald Super's Developmental Self-Concept Theory, posed by each sub-stages—Crystallization, Specification, and implementation. This study provides insight into how these recent graduates navigate their initial career choices, refine their career goals, and implement their career decisions. The study seeks to uncover patterns, challenges, and shared successes of career development programs by legal management graduates, which inform future graduates of academic achievement, career counseling options, and business-learning workshops.

## REVIEW OF RELATED LITERATURE

Donald Super's developmental self-concept theory provides a comprehensive framework for understanding the career development of new college graduates. This theory suggests that career development is a lifelong process closely tied to an individual's changing self-concept (Hutchison & Niles, 2016). Super's theory is particularly relevant for recent graduates because it includes crucial steps. The theory suggests that individuals develop at different stages of life, most notably the exploratory stage in early adulthood (typically ages 18-25) (Super & Kidd, 1979). This stage is essential for fresh graduates because it is lateral. The Exploration stage in Donald Super's Developmental Self-Concept Theory is divided into three sub-stages: Crystallization, Specification, and Implementation (Soto, 1997). These three sub-stages help lend an in-depth understanding of individuals' processes and decisions while exploring potential careers (D'Achiardi, 2005). The Super theory emphasizes that career choice expresses one's perspective, which continues to evolve through experiences and practical activity. For new graduates, this means that their career paths are not just about applying for jobs but about exploring different roles, testing their abilities, and slowly shaping professional identities into their ideas.

In Crystallization (Ages 14-18), individuals get more crystallized in their ideas regarding their interests, values, and abilities. They begin exploring diverse fields and careers that fit their self-concept and future goals (Kurtyka-Chałas, 2014). This generally is a period of relatively undirected exploration during which youth entertain many potential careers and begin forming preliminary goals (Ramey, n.d.). The significant difficulties faced by business students in this stage include minor exposure to the variety of career options available, sociocultural pressure to select a 'successful' career, and confusion related to personal interests and values.

In the lower sub-stage of the Specification phase (Ages 18-21), individuals narrow their work choices even more and make more specific decisions. This often involves the selection of a college major or a particular area of business study, such as finance, marketing, or management (Leung, 2008). A clearer idea begins to form about the individual's most preferred career path. However, with this clarity, there still may be uncertainty and indecision. For example, Business graduates may fear that they will not like a particular industry or may pursue a specific path and later be disappointed that it does not afford many job opportunities (Sharma, 2022).

Implementation (Ages 21-24) is the sub-stage in which a person takes concrete steps toward work. It entails searching for possible jobs and applying for them, encouraging good internships in chosen areas, or looking for entry-level jobs if necessary (Maree & Maree, 2020). It is a stage marked by going from being a student to being a professional, and adjusting is hard. Most business graduates at this sub-stage face challenges of job market competition, high pressure, demand to secure a position quickly, and actual entry-level positions that might not fully fit what one wants or use their knowledge and skills (Arbona, 2003).

These sub-stages provide a closer intermediate look at the Exploration stage, which clearly shows how, during gradual career development, one passes from general exploration to progressively specific decision-making and finally to a more active job search (Gati et al., 2019). Awareness of these sub-stages helps identify challenges a person can go through at these respective career stages and brings forth a vital issue of career guidance and support during this formative period.

In the Crystallization Stage, one starts to develop more specific ideas about one's interests, values, and abilities. For a newly graduated student in business administration, this is generally a time of uncertainty and exploration. One of the significant challenges at this level is that there are so many different areas related to the business field that it potentially causes analysis paralysis in a student (Sharma, 2022). Some statistics from a study by NACE in 2023 reveal that approximately 37% of business graduates were confused about choosing a career due to obscure personal interests and proper matching with their relevant jobs (National Association, 2023). A study by GMAC showed that 42% of graduate business students felt compelled to pursue high-paying jobs rather than personally interesting or core-value-related jobs due to societal pressures and financial considerations (Murphy, 2023, November 8).

At the Specification Stage of Specification, choices get narrowed down for newly graduated business students in their career options, and they start making more specific career paths they want to pursue. This phase is, however, accompanied by the complications of choice and professional specialization (Lagasse, 2004). Too many business graduates suffer uncertainty and hesitation to opt for a specific career line out of fear of the wrong choice, significantly when the nature of work is rapidly changing. In its 2022 survey, LinkedIn reported that 45% of young professionals felt pressured to specialize too early in their careers, which later turned into regret over their chosen paths (Heitmann, 2018, October 11). Moreover, graduates' skills often do not match the employer's requirements. According to the 2023 report by the World Economic Forum, 36% of employers believed that business graduates lacked practical skills in their chosen specializations, hence a gap between academic preparation and industry requirements (World Economic Forum, 2016).

Implementation is the step where concrete steps of entering the workforce are taken, such as applying for jobs, attending interviews, and starting internships or entry-level positions. This shift from student to professional life is intimidating for a newly graduated business student. The most prominent issue at this stage is related to the highly competitive job market (Hasanah, 2019). As per the Bureau of Labor Statistics, the unemployment rate for recent business graduates was 6.2% in 2023 (Borkowski et al., 2024, May), more than the overall unemployment rate of 3.8% (Unemployment rate, 2024, March). Further, more than half of fresh graduates face underemployment—having jobs that do not put their skills to work or do not pay well and give further career prospects. A 2022 study by the Strada Education Network found that 41% of the business graduates from the past year were in jobs that did not require a degree, leading to dissatisfaction and no career advancement (From College to Career, n.d.). Also, graduates often find issues with unrealistic expectations of the first job versus entry-level reality, which usually results in early career turnover. A 2023 Gallup poll

revealed that 33% of new graduates departed from their first job within a year since the job did not match the requirements and needs of their career aspirations and development (Inc, 2014, April 10).

Altogether, newly graduated business students struggle to pursue a career development pathway through the stages of Crystallization, Specification, and implementation (D'Achiardi, 2005). These challenges require more focus on delivering better career guidance and obtaining practical business skills in business education to ensure that graduates are prepared for the career job market (Ghavifekr et al., 2021). Closing the gaps in these areas helps graduates better inform themselves on decision-making, focusing on careers based on interests and abilities, and finding professional fulfillment.

The crystallization sub-stage allows new business graduates to clearly understand their career interests, values, and abilities in finer detail. According to the Developmental Self-Concept Theory, this stage is suggested to involve exploratory behaviors that allow an individual to form a tentative career goal. However, some research has shown this process to be more complicated for business graduates (Hartung, 2020). Career decision-making indicates that due to the vast number of career trajectories open in business areas, many graduates experience decisional anxiety. It seems an apparent contradiction of Super's notion of linear progression from broad interests to specific career goals, suggesting perhaps the crystallization stage is more trial and error—less clear cut—than this theory would propose (Gati et al., 2019).

As indicated, the research has also pointed out that career choice is subject to external and non-constant factors like the environment, economic conditions, and societal influences (Brown & Lent, (Eds.), 2012). These findings suggest that business students have more difficulty crystallizing their career choices not so much because of the other environmental impacts and market conditions but rather because it is accounted for in Super's very linear framework (Salome, 2013).

As for Super's theory, the specification sub-stage is when individuals start narrowing down their occupational options and becoming much more concrete in making decisions regarding their professional paths. Nevertheless, recent findings supported and challenged this view in the context of newly graduated business students (Super, 2020). Career adaptability is a construct from Savickas's research in 2005, which suggests that at this phase, some graduates successfully redefine their career goals, while others find it difficult due to lack of purpose of work experience and industry exposure. The challenge in fields like business, where the dynamism of the job market is so high that a constant review of career decisions becomes second nature. Research in 2005 suggests that the specification process is far from linear and clear-cut. It frequently entails reconsidering the decisions made before since graduates have new information or opportunities. This level of complexity results in indecision or career path changes, quite the opposite of Super's more structured perspective at this stage (Lee, 2005). In some way, Super's specification stage is there, but the process is far from definitive and more iterative for business graduates.

During the implementation sub-stage, one starts to take tangible steps towards a selected career: looking for a job, attending job interviews, and getting into their first professional position. Super's theory postulates that during this stage, there is the transition from school to work, and individuals strive to become established in their preferred career direction (Pal & Jena, 2021). Another study argues that their research shows how recently graduated business students face severe obstacles while transitioning (Han et al., 2022).

The other factors that are caused by prolonged job search and underemployment are a tight job market, skills deficits, and a high level of competition that are not well provided for in Super's theory. Protean Career Theory, as discussed by (Gubler et al., 2014), emphasizes career self-management and adaptability of individual factors almost excluded in Super's model. The theory states that the implementation stage is not a process of simply entering work but one of life learning and career adaptability—both closer to what occurs for many business graduates in continually changing job market circumstances (Chan et al., 2015). It, therefore, follows that even though the implementation stage of Super's theory provides a model for the early career transition period, it is insufficient to capture the richness and dynamism of career development for today's business graduates who are just entering the workforce (Noppeney et al., 2022).



The above discussion established that Donald Super's Developmental Self-Concept Theory develops a foundation or provides the frame for career development; recent studies and theories show the process is not simple, especially from the standpoint of a new graduate in business. The challenges posed by each sub-stages—Crystallization, Specification, and implementation—all call for a more dynamic and adaptive approach toward career development, considering the various external influences on market conditions and the necessity for constant learning and adaptability.

## METHOD

This study used a quantitative research design, the cross-sectional survey. This process involves collecting data from the B.S. Legal Management graduates. The cross-sectional approach allows for mapping (Mandil, 2018) of the career development experiences of new college graduates.

A structured questionnaire was adapted, and the University's Research and Publication Center (RPC) developed it as the primary research instrument for a tracer study. The questionnaire consisted of closed-ended questions designed to gather information (Uka, 2015) about respondent's demographic characteristics, career development experiences, and career attitudes with Donald Super's Developmental Self-Concept Theory, the three sub-stages—Crystallization, Specification, and implementation. The target population for this study was 17 graduates of B.S. Legal Management in the last 3 to 5 years. These graduates were selected to ensure they had sufficient career experience to provide valuable insight into their career development plans.

Descriptive statistics were used to summarize participants' demographic characteristics and career development experiences. A Gaussian mixture model (GMM) was used to group participants based on their responses to the questionnaire. GMM is a probabilistic clustering technique that identifies different clusters in a data set (Jadhav & Dharwadkar, 2018). This study aimed to identify career paths or groups among graduates and explore the factors affecting their career development.

The Collected data was cleaned to remove any discrepancies or errors. The Descriptive statistics were calculated for demographic variables and career growth indicators. Based on the respondents' responses, GMM was applied to the data set to identify their distinct groups. Also, the characteristics of each group were analyzed to understand different career path processes and factors affecting them. Findings were compared with Super developmental psychology theory to identify similarities and differences. This research design allowed for a systematic and rigorous examination of the career development experiences of B.S. Legal Management graduates, providing valuable insights into factors influencing their career choices and outcomes.

## RESULT AND DISCUSSIONS

The study aims to identify unique career clusters among legal management graduates relative to their personal disposition and resultant career decisions. In turn, the results identify the varied career paths this graduate cohort took and the factors influencing their decision this early in their career.

This is presented in Table 1 to show the status of career development among the new business professionals fresh from college. It quickly explained and made meaningful concerning the findings of this study using Donald Super's Developmental Self-Concept theory and the three sub-stages of Crystallization, Specification, and Implementation to understand the challenges and progress that the graduate faces in career transition.

Table 1 Career Development Status of B.S. Legal Management Graduates

Items	Mean	S.D.
Length of stay in current job (years)	1.14	1.02
Position at work	0.62	0.47
Employee under supervision	7.26	7.72
Salary (000's)	39.82	21.49

The Crystallization Stage is characterized by a short stay in a current job, usually an entry-level position where individuals begin to explore their career interests and potentials. The new graduates have an average stay in the current job of 1.14 years, whereas the standard deviation is 1.02 years. The period relates to the fact that many graduates are in search mode and, therefore, remain at the earlier part of the development of their careers in the sense of their career development model, the Crystallization stage. Most probably, they have been exploring different jobs or environments that determine their interests and capabilities—a major cause of frequent job shifts in search of better matches. The mean position at work score of 0.62, with a standard deviation of 0.47, reinforces that these individuals are primarily in entry-level positions that reflect their early career stage.

The Specification Stage is when people focus and commit to specific career decisions. Not much career outcome variation is there among people at this stage, as noticed by the standard deviations. For example, the average number of personnel under supervision is 7.26, with a relatively large standard deviation of 7.72. This indicates that while some graduates start to get supervisory positions over this number of personnel, others remain with little or no direct supervision. The variability is consistent with the Specification stage, where individuals further define their career paths, and their job responsibilities may differ according to their field or specialization. Further, the relatively large standard deviation for salary (P21,490) pointed to a wide range of wages, a description of diverse positions graduates might hold during this phase of career development. At the same time, they begin to concentrate and set a course for more defined careers.

The implementation Stage, or settling into chosen career paths and starting to establish oneself professionally, is characterized by the mean salary of P39,820, suggesting that, on average, newly graduated business professionals earn moderate income as they start their careers. Admittedly, this is not an extremely high level of remuneration. Still, it is ideally within the expected norms for any entry- to the mid-level position that most graduates take in the first few years of their professional careers. As they grow in experience and consolidate their positions, they move more and more to the Implementation stage, where they establish careers and possibly take on more responsibility. The variability in the number of employees under supervision and the standard deviation of the position at the workplace tend to suggest that some graduates probably progress fast into more responsible roles, just as it is the dominant theme during the Implementation stage of job establishment and progression.

In the general descriptive sense, graduates in business are mainly at the formative career stages, marked by an explorative phase, role settling, and the early phase of job development. This is aligned with Super's Developmental Self-Concept Theory, from the explorative stage found in Crystallization, then to the more defined stage in Specification, and ultimately at the point of Identification, when career path choices firm up. These stages reflect a dynamic process: people step through various phases in constructing their professional identities while demonstrating flexibility in response to the plight of a working individual.

The data in the descriptive statistics table indicates the career development of newly graduated legal management professionals as analyzed using Donald Super's Developmental Self-Concept Theory. The data is credited to many competencies and experiences attuned to the three sub-stages of career development: Crystallization, Specification, and Implementation.

Table 2 Indicative of the Career Development Level of B.S. Legal Management Graduates

Item	Mean	S.D.	D.E.
Skill set used	4.76	0.64	Very High
Consulted in job	3.88	0.90	High
Ability to Solve Problem	4.12	0.58	High
Multidisciplinary Project	4.12	0.83	High
Research project	2.88	1.41	Moderate

Entrepreneurial venture	3.35	1.49	Moderate
Program Education Objectives	4.38	0.54	Very High
Student Outcome	4.39	0.54	Very High

Crystallization's first stage involves exploring various career choices and knowledge of one's capability and interests. Finally, crystallization students tend to have a moderate level of participation in diversified activities at this stage because they are trying to pin down their career preferences. This is depicted in Table 2 by the following categories: research projects (Mean = 2.88, S.D. = 1.41) and entrepreneurial ventures (Mean = 3.35, S.D. = 1.49). Graduates in the Crystallization stage are unsure and may involve themselves in various projects and opportunities. These items have high standard deviations, which indicate a high level of variability in the levels of involvement expected. Typically, it is at the Crystallization stage when graduates explore many different career paths without a solid commitment to any one path.

It is at the point when individuals are moving towards the Specification stage that they begin to reduce the number of their career options and concentrate on specific areas or fields of interest. In this connection, graduates demonstrate a very high usage of the skill set (Mean = 4.76; S.D. = 0.64), indicating that applying skills in an even more consistent way is initiating at their job. The high mean scores for problem-solving ability (Mean = 4.12, S.D. = 0.58) and involvement in multidisciplinary projects (Mean = 4.12, S.D. = 0.83) suggest that these graduates actively engage with specialized tasks requiring specific skills and problem-solving capabilities. From Table 2, the lower standard deviations of the competencies indicate that skills are applied more evenly among the individuals, and this relatively confirms the Specification level of one's career path.

The Implementation stage is when one's career is established and expanded. During this phase of life, people settle in with their career choices and continue to grow their competence. The data reflect very high levels of alignment with Program Educational Objectives (mean = 4.38, S.D. = 0.54) and Student Outcomes (mean = 4.39, S.D. = 0.54), indicative that the implementation-stage graduates are applying their education well in their careers. This alignment indicates that they have chosen career paths that correspond closely with their educational backgrounds, marking the Implementation stage where they establish themselves. Besides, job role high consultation (mean = 3.88, S.D. = 0.90) conveys many job roles to which graduates have a good attitude at this stage, manifesting their authority and increased professional involvement in the process.

Thus, the general trend one derives from the descriptive statistics is that it describes a movement from the exploration stage to the establishment of newly graduated legal management, congruent with three sub-stages identified in Super's theory. The data explains how graduates begin to explore various opportunities and prepare for them, narrowing these choices down to specific career decisions. Finally, they become established in those careers that coincide with their academically trained skills and professionally desired positions.

Table 3 displays the descriptive data regarding PEO and SO, providing information on recent career development among legal management students, even more so when they are couched against the Developmental Self-Concept Theory by Donald Super. The theory postulates that people undergo several developmental stages of a career: Crystallization, Specification, and Implementation, all aligned with the graduates' self-assessment of preparedness for practice.

Table 3 Program Education Objectives and Student Outcomes of the B.S. Legal Management Graduates

Program Educational Objectives (PEO)	Mean	S.D.	D.E.
Attainment of the program educational objectives of the B.S. Legal Management course	4.44	0.50	Very High
PEO A. Provide financial solutions regarding social, environmental, economic, and ethical considerations.	4.44	0.68	Very High

PEO B. Apply financial software skills as required by the business environment.	4.33	0.82	Very High
PEO C. Express clearly and communicate efficiently and effectively with stakeholders in oral and written forms.	4.56	0.60	Very High
Mean	4.44	0.56	Very High
Student Outcome (SO)			
SO - a Please rate how well you have attained the student outcomes of your academic program:	4.28	0.65	Very High
SO - b Prepare, analyze, and evaluate reports, proposals, and concept papers.	4.61	0.49	Very High
SO - c Exemplify fairness, transparency, accountability, hard work, honesty, patience, diligence, innovativeness, and risk-taking.	4.78	0.42	Very High
SO - d Use appropriate financial and technological tools and techniques to solve problems and perform other related tasks.	4.28	0.65	Very High
SO - e Interpret data for decision making	4.22	0.71	Very High
SO - f work with others and in multidisciplinary teams which may involve people from diverse backgrounds.	4.39	0.76	Very High
SO - g Engage in continuous research in pursuit of lifelong self and professional development	4.33	0.75	Very High
Mean	4.41	0.54	Very High

The mean scores of all items in the PEOs are very high. Alumni perceive themselves as exceptionally well-equipped to achieve their educational objectives, with an average rating of 4.44 and a standard deviation of 0.56. The very high level of self-reported achievement suggests that these graduates have a strong sense of their ability to accomplish a variety of program objectives, from providing financial solutions in a comprehensive setting—PEO B, mean = 4.44—to using financial software skills in an applied context—PEO C, mean = 4.33. This confidence level matches the Crystallization sub-stage of Super's theoretical framework, wherein a person commences to acquire a more transparent, crystallized perception of interests and competencies in their field of work. At this step, graduates are in the process of discovering and verbalizing their professional identity. High ratings indicate a more vital matching between educational experiences and career goals.

The average scores for Student Outcomes, computed at 4.41 with a standard deviation of 0.54, also depict a high degree of perceived readiness in critical areas that ensure career success. The results suggest that the ability to develop and critically evaluate reports SO-b, mean = 4.61, and demonstrate professional ethics SO-c, mean = 4.78 are also very important during the Specification phase of career development. By this stage, students are expected to have further refined their career choices and acquired the specific skills and competencies associated with chosen paths. Scores on most outcomes are relatively high, indicating that graduates felt they were relatively well-equipped with the skills needed to establish a professional role.

The very high scores for PEO and SO show that the graduates are ready for the implementation phase, where they begin their professional journeys and apply their competencies in real-world scenarios. For example, the



competencies in using financial instruments and working in multidisciplinary teams, with mean values of 4.28 and 4.39 (SO-d and SO-f), constitute an integral part of successfully taking up professional roles. The low value of standard deviations throughout reflects a relatively stable level of confidence among the graduating class, indicative of a shared sense of preparedness in applying skills and knowledge in chosen fields of operation. The generally high mean scores and low standard deviations in the descriptive statistics highlight that recent graduates of legal management programs typically believe themselves to be well-prepared to enter and succeed in their careers, which aligns with the stages noted in Super's theory. This feeling of being prepared mirrors a robust educational system promoting career development through the process of clear understanding, skill development, and effective performance in practice.

Table 4 presents the results of the Gaussian Mixture Model clustering analysis run on several factors relating to career development: length of stay in the current job, position at work, number of employees supervised, salary, setting apart usage of skill sets at work, consultation, problem-solving, multidisciplinary projects, research projects, entrepreneurial ventures, program education objectives, and student outcomes. The clustering of this data into three well-differentiated clusters based on these variables is interpreted in the light of sub-stages, as defined by Donald Super's Developmental Self-Concept Theory: Crystallization, Specification, and Implementation.

Table 4 Gaussian Mixture Model clustering analysis

Cluster	Length of stay in current job	Position at work	Employee under supervision	Salary	Skill set used	Consulted in job	Ability to Solve Problem	Multidisciplinary Project	Research project	Entrepreneurial venture	Program Education Objectives	Student Outcome
Cluster 1 Implementation	1.28	0.51	8.10	34.00	4.80	3.80	4.30	3.80	3.00	4.05	4.31	4.31
Cluster 2 Specification	1.16	1.00	6.88	74.50	4.50	4.25	4.00	4.75	3.00	3.69	4.39	4.39
Cluster 3 Crystallization	0.68	0.50	5.00	13.00	5.00	3.67	3.67	4.33	2.33	4.50	4.7	4.67

Cluster 1 appears to define the Implementation sub-stage of Super's theory. The average tenure in the current job is 1.28 years, indicating that most in This cluster have recently transitioned from the college campus to the workforce and are now in the early stages of their work life. Their job position is relatively low, with an average position score of 0.51, commensurate with entry-level jobs. However, they have a moderate number of people they supervise—averaging 8.10, reflecting some responsibility. The average salary 34.00 suggests they are in relatively lower-paying positions than Cluster 2. Their skills usage score of 4.80 and work consultation score of 3.80 indicate that they are using their skills and being consulted moderately within their respective roles. The involvement scores in multidisciplinary projects were 3.80, in research projects 3.00, and entrepreneurial projects 4.05, all moderate and characterizing the Implementation sub-stage when individuals apply their skills and knowledge (Han et al., 2022) in practice and real-world settings. The scores for program educational objectives and student outcomes are both 4.31 and, hence, high, indicating that they are more likely to serve in positions suitable to their qualification (Murp-Meak, 2019), a characteristic of the Implementation stage.

Cluster 2 seems best to fit the Specification sub-stage. The average tenure in their current job among the people in this segment is 1.16 years, which is very much in line with Cluster 1 and thus indicates that most are also at the beginning of their careers. Their position at work, however, is higher, with an average position score of 1.00, while supervising fewer people on average, 6.88, thus indicating roles that are more specialized but with less managerial responsibility. Most importantly, their average wage of P74,500 is way above that of others at this age, indicating that they chose fields that turned out to be more paying than others, a characteristic of the Specification sub-stage where a person starts narrowing choices and focusing on fields. This cluster has a slightly lower score in the skill set usage at 4.50 compared to Cluster 1, with a higher consultation at work

score of 4.25, indicating that the persons in this group are more engaged in the decision-making process at work. This cluster also got the highest score for multidisciplinary projects, 4.75, pointing to active participation in diverse projects, typical of the Specification sub-stage when individuals seek to refine their careers further and specialize in areas (Sharma, 2022). The scores for program education objectives and student outcomes are also high, showing that these people actively apply their education in their job roles (Hartung, 2020), which is often the case in the Specification stage.

The most likely label of Cluster 3 is the Crystallization sub-stage. This group, with an average length of stay in the current job of 0.68 years, is seemingly in the beginning phase of career exploration, in which a person starts to crystallize his career interests and commence tentative choices. Their low average position score of 0.50 and fewer employees under supervision may suggest junior or entry-level positions, aligning with the nature of the Crystallization stage, which is an exploration time in life. The average salary of P13,000 is the lowest of all the clusters, indicating that this should be early-career roles, which are typically not as financially rewarding. However, the very high score of 5.00 on the skill set use subscale implies that they are involved in learning and actively using their skills in attempts to find out where they best fit in the Crystallization stage as they explore various fields and roles. Lower scores for items regarding consultation at work, 3.67 (high); involvement in research projects, 2.33 (low); and entrepreneurial ventures, 4.50 (very high), indicate a stage when they are still learning and therefore involved less in decision-making or leadership roles. However, the very high mean scores for program education objectives and student outcomes are 4.67 and 4.67, respectively, indicating that they are very much focused on it as people in the Crystallization stage begin to apply academic learning in real-world contexts (Boselie & van der Heijden, 2024).

GMM clustering analysis extracts distinct patterns for newly graduated business professionals, with clear correspondence offered to the sub-stages described by Donald Super in his developmental self-concept theory. Cluster 1 aligns with the Implementation stage, in which people try to establish themselves in their careers; Cluster 2—Specification, where they try to refine the kind of career a person wants to have; and Cluster 3 corresponds to the Crystallization phase, in which people are exploring options and interests related to the job they want to pursue.

Table 5 conveys that the GMM cluster index arranges the data points into three clusters: Cluster 1, Cluster 2, and Cluster 3. Each line is for a specific data point; the columns define to which cluster it belongs—the '1' indicating that it is in the cluster and '0' otherwise.

Table 5 GMM cluster index table

Index	Cluster 1	Cluster 2	Cluster 3
0	1	0	0
1	0	1	0
2	1	0	0
3	0	1	0
4	1	0	0
5	0	1	0
6	1	0	0
7	0	0	1
8	0	0	1
9	1	0	0
10	0	0	1
11	0	1	0
12	1	0	0
13	1	0	0

14	1	0	0
15	1	0	0
16	1	0	0

According to the table, Cluster 1 contains the bulk of the data points and has ten members; therefore, this cluster's percentage is quite sizeable in the dataset. Cluster 2 has 4 data points, which is relatively small but still significant. The smallest is Cluster 3, with 3 data points, indicating that this is a somewhat more distinct or less common grouping within the data.

The distribution shown as a result indicates that the set, although predominantly showing the trends defining Cluster 1, still deviates slightly towards features characteristic of both Clusters 2 and 3. According to Donald Super's Developmental Self-Concept Theory, these variations between the three clusters are very enlightening about the different attributes or behaviors of the data, representing various stages or characteristics relevant to career development in newly graduated legal management students. Each cluster shows the different sub-stages or levels of maturity in career development, like Crystallization, Specification, or Implementation, detailing how the graduates progressed in their career trajectories.

In Table 6, the weights associated with the Gaussian mixture model include Weight 1: 0.588235, Weight 2: 0.235294, and Weight 3: 0.176471, all representing the proportion of data points allocated to the three identified clusters described in the model. These weights reflect each cluster's relative size and importance in relationship to a more extensive data set.

Table 6 Weights of the Gaussian Mixture Model

	Weight	Percentage	n
Cluster 1 Implementation	0.588235	58.8%	10
Cluster 2 Specification	0.235294	23.5%	4
Cluster 3 Crystallization	0.176471	17.6%	3

Weight 1 is About 0.588, suggesting that Cluster 1 is the most significant and represents about 58.8% of the dataset. This shows that a large proportion of the recently graduated legal management students in this study are typical of the profile that describes this cluster and, therefore, represents a typical career development phase, like the Crystallization stage, in which individuals begin the process of forming and clarifying their ideas about careers they like to pursue.

Weight 2, which accounts for 0.235 (23.5%), is a minor dataset segment, indicating that Cluster 2 represents a less prevalent but still important cluster. This refers to students in some further refined career planning phase, for example, at the Specification stage, when they start narrowing down their options and making firm career choices.

Weight 3, the lowest at 0.176, 17.6%, indicates that Cluster 3 is less prevalent and signifies a more distinctive or specialized subset of this dataset. The cluster corresponds to the implementation phase, where the graduates actively participate in their elected careers, applying developed skills and knowledge in a professional environment.

The overall weight distribution underlines the different phases of career development that newly graduated legal management students have gone through, indicating a transition from extensive career exploration to its targeted implementation.

Below in Figure 1 is the heatmap representing the covariance matrix derived using a GMM from the clustering results, showing relationships between variables on career development stages that fresh graduates went

through. Based on the Developmental Self-Concept Theory by Donald Super it shows how some of the variables are related to others within the three sub-stages: Crystallization, Specification, and Implementation.

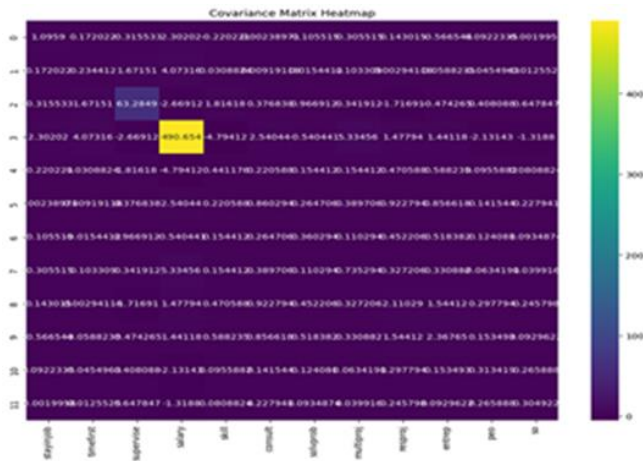


Figure 1. Covariance Matrix Heatmap

During the crystallization phase, while a person is still exploring different careers and roles, higher variances and lower covariances are expected among most variables since graduates are not yet specialized, which again aligns with lighter colors in off-diagonal elements. The Specification phase, during which there is a crystallization of refinements, focusing on preference in specific careers, tends to show stronger relations among the variables that operationalize a congruence between abilities and occupational roles; this manifested slightly in richer colors seen in those charts relating skills, e.g., "skill," to specific job characteristics like title or compensation. The Implementation phase finally symbolizes commitment to one chosen career path and typically increased covariances, as represented by the darkest colors in the heatmap. For instance, "salary" and "supervise" are very highly correlated, which means that people in the implementation phase are positioned in a way where supervisory tasks are performed. Compensation levels are more strongly linked, showing more substantial role stability and a more established sense of career. The overall heat map visualizes the extent to which different career-related characteristics covary and describes with some emphasis and experiences the sub-stages (Abrahamson, 2008), according to Super, defining each in his career development model.

Figure 2 illustrates the result of clustering using a Gaussian Mixture Model. The ellipses show the clusters, and the figure conveys that three are formed based on two features to separate the groups of observations. With developmental self-concept theory, as Donald Super posited, the clusters are the sub-stages—Crystallization, Specification, and implementation—that present different stages in the career development of legal management graduates. That is, Cluster 1 is at the stage of Crystallization.

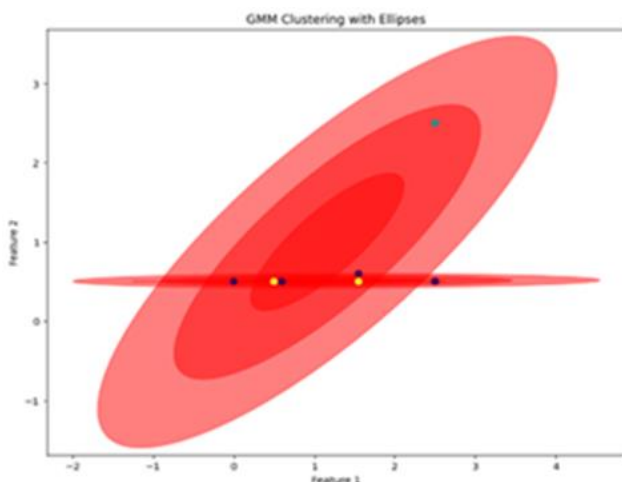


Figure 2. Gaussian Mixture Model Clusters Ellipses



This stage is made up of the discovery of career options, which, in the end, results in so many directions that little progress exists in any one direction, thus the horizontal spread. Cluster 2 is shaped by an ellipse that is slightly more 'squished' than the one created by Cluster 1 but whose ends are more divergent than those of Cluster 1, and hence cluster 2 likely corresponds to the Specification stage. Here, they start to converge towards their career choices, concentrating more on specific roles and industries as the column tilts inwards further, showing a more vertical variance in the cluster. Then, the third cluster, Cluster 3, the ellipse most elongated and extending highest up along Feature 2, possibly belongs to the Implementation stage. In this stage, most choose their careers and are moving up, represented by the cluster stretching further up the vertical axis. The color-coding of points also distinguishes these clusters further, proving the spread and density of the career-development (Vahidi, 2021) stages as theorized by Super.

Evaluation metrics for GMM clustering, reflected in Table 7, are for different numbers of components, including Bayesian Information Criteria, Akaike Information Criteria, and Silhouette Score. These two exactly do what they do: measure the quality of fit of a model with the penalty on the count of parameters to avoid overfitting. The 2-component model obtains the lowest BIC (-405.067577) and AIC (-707.524021) values, indicating the best fit and balance of complexity. Silhouette score mirrors the separation between clusters; the higher the value, the better defined the clusters (Rautio, 2024). The Silhouette Score peaks at 0.616665 with no clusters ( $n_{components} = 0$ ) and decreases with more clusters, showing less distinct clustering. It is in the top score for a multi-cluster model of 0.552645 with six components, indicating reasonable separation. Results show that based on BIC and AIC, the 2-component model fits the best. For the Silhouette Score, 6-component model results express good cluster definition. This means there must be a trade-off between complexity and clarity (Lagrange et al., 2017) in understanding Donald Super's Developmental Self-Concept Theory stages.

Table 7 Evaluation metrics for GMM (AIC, BIC, Silhouette Score)

<b>n_components</b>	<b>BIC</b>	<b>AIC</b>	<b>Silhouette Score</b>
0	415.5533	264.74169	0.616665
1	-8.685195	-235.31923	0.464468
2	-405.06758	-707.52402	0.475494
3	-240.6125	-618.89136	0.423938
4	-248.99367	-703.09494	0.526754
5	-59.248808	-589.17249	0.53683
6	77.441513	-528.30459	0.552645
7	271.89543	-409.67308	0.462421

Based on Donald Super's Developmental Self-Concept Theory, the GMM clustering solution of 3 clusters is a more sensible option because of practical and theoretical considerations such as its alignment with the theoretical framework. Donald Super's theory dictates that career development goes through three sub-stages: Crystallization, Specification, and Implementation. These stages represent the different career decision-making and development phases for newly graduating individuals. A 3-cluster model aligns directly with these substages and meaningfully provides a framework to interpret the clusters to represent existing career development theory.

There is a balanced complexity and interpretability, and such is the case that BIC and AIC values are lower, more in the 2-cluster model, into a statistically better-fitted model. However, the 3-cluster model seems to balance interpretation and model complexity. The BIC of the 3-cluster model goes to -240.6125, and the AIC goes to -618.891358. These are not the lowest but still reasonably competitive. While these criteria do rise slightly from the 2-cluster model, this indicates more complexity, but this is justified in terms of the model's ability to differentiate amongst three meaningful stages.

There is an adequate cluster separation: the silhouette score of the 3-cluster model is 0.423938. Though this is not the table's maximum score, it indicates moderate separation of clusters. In scores, models with a more significant number of clusters (say 6) have only slightly improved separation (0.552645 for 6 clusters). Still, it makes the model needlessly complex and reduces interpretability aligned with Super's theory.

It reflects real-world career development. The career development of a newly graduated business professional generally falls along three typical stages of progression: career options exploration (Crystallization), focus on specific roles (Specification) and getting established in their chosen paths (Implementation). Not only is there theoretical solid support for the 3-cluster model, but it also reflects the typical patterning across these career stages.

The 3-cluster solution, in general, optimizes the good overall model performance in terms of statistical and theoretical interpretation considerations. This makes it feasible to model career development stages based on Donald Super's Developmental Self-Concept Theory.

## CONCLUSION AND RECOMMENDATIONS

From the above analysis and discussions, it is evident that professional development among recently graduated legal management students takes different forms in the three sub-stages identified by Donald Super in his Developmental Self-Concept Theory: Crystallization, Specification, and Implementation. The GMM clustering results and descriptive statistics indicate that a large proportion of the graduates in the study were primarily at the Crystallization stage, characterized by a broad exploration of career possibilities and initial comprehension of interests and abilities. This finding is supported by the fact that the highest weight value was observed for Cluster 1, indicating that most graduates still define their career goals and preferences. Nonetheless, the fact that these clusters are located around the Specification and Implementation phases, although less marked, suggests that some graduates moved beyond exploration to the systematic development of their career choices and application of their skills in initial practice settings.

The data shows moderate to high ratings about competencies such as problem-solving, multidisciplinary project engagement, and financial and technological instrument utilization. These competencies relate to the Specification and Implementation phases when the practical application of knowledge and skills becomes more evident. Although many students who have recently graduated from programs in legal management are in the early stages of career development, exploring a wide range of career paths exists. Evidence supports that further concentrated career planning and pursuit occur. On the part of these academic institutions and their career services, focused advising and resources are provided to meet the unique needs of students at all levels.

Improved career counseling and support are needed to provide career counseling services so that Crystallization students are better informed of their interests, strengths, and possible career paths through workshops, mentorship programs, and access to appropriate career assessment tools.

Facilitating networking opportunities with industry professionals helps across all stages. Those still crystallizing their career goals get great insights from the various careers available—those in later stages of progression benefit from utilizing these networks for job placements and upward mobility. A mechanism through which employers and alumni may regularly provide feedback helps the legal management curricula in educational institutions be better tuned to the shifting nature of the job market so that their graduates are suitable for the profession they had opted for. In addressing the specific needs of students at different stages of their career development, it becomes possible for educational institutions to better prepare legal management graduates for successful transitions from the academic environment into professional life.

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