UW-La Crosse Students Knowledge of Undergraduate Research Opportunities

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INTRODUCTION

UW-La Crosse offers many unique opportunities for students in every field. Undergraduate Research (UR) is one such opportunity at UW-L, as few other universities offer these experiences to the same extent. Through UR, students can gain practical experience in their respective fields and learn how to apply classroom knowledge to real-world situations. Recently, the importance of UR was illustrated through the allocation of funds from differential tuition. Many students have benefited from participation in UR and it is important to understand its effect here at UW-L to help students reach their full potential. Although there has been an increased concentration and emphasis put on UR, it is not known at what levels students are informed, participate, and perceive these opportunities.

The population of study was the undergraduate student body of UW-L, which consists of 8002 undergraduates. It is important to know how many students are aware of these opportunities and to what level they are informed. Student perceptions may also give helpful insight into making improvements to existing programs and reaching more students.

The purpose of this study was to gather information about student informedness, participation and perceptions of UR at UW-L. More specifically, we wished to estimate the average level of awareness on a 0 to 5 scale (0 being least aware, 5 being most aware). We were also interested in the proportion of students that have performed UR, as well as the proportion of students that have a positive view of UR versus those that have a negative view.

There were three main subpopulations of interest, categorized by year in school (by credit number), college, and by year in school within each college. By looking at year in school, we can see if there is an age and/or exposure influence. Presumably, if students have more college experience, they will more than likely be more aware of UR opportunities on campus. As older students begin to look past their undergraduate years, they may be interested in gaining research experience to make them more competitive in the job market or when applying to graduate school. Concurrently, freshmen will have less exposure to UR opportunities, thus being less informed. A student's college affiliation may also affect the variables of interest. Students in the College of Science and Allied Health (SAH) may be more inclined to participate in UR than those in the College of Business and Administration (CBA) due to their respective curricula. There could be increased opportunities or advertising for research positions in a certain college, raising awareness and/or interest in these experiences. The combination of year in school by each college will give the most detailed information. It will allow us to look at age groups within the colleges to determine specifically what levels of interest, awareness, and participation are found for each group. For example, if freshmen in the College of Liberal Studies (CLS) have the lowest awareness but high interest, then administration can focus on getting those students involved in UR.

METHODS

The sampling frame variables included name, e-mail address, year in school (by credit number), and college affiliation. The sampling unit was an individual student at UW-L. A stratified design was used in this survey, with 16 total strata. The strata were defined by year in school in each of the four colleges. For example, sophomores in the College of Health, Physical Education, Recreation, and Teacher Education (HPERTE) would be considered a single stratum. See Table 1 for strata population sizes. Ranges for individual years in school were estimated to be smaller for freshman and seniors but large for sophomores and juniors. Therefore, the standard deviations were made to be 0.75, 1.00, 1.00, 0.75 for freshman, sophomores, juniors, and seniors respectively. Sample sizes were calculated for finding the average awareness level and proportion of students involved in UR. The mean required a larger sample size, with $n = 238$, so this sample was used for the study. Allocations were calculated for each strata, and then corrected for a projected 50% nonresponse (NR) rate (Table 1). The survey was sent to 576 undergraduate students at UW-L, to allow for NR.

Table 1. Allocations, Sample Size, and NR Rate (%)

Strata	N	*n*	*n* adj. for NR	Responses	NR Rate %
CBA1	288	9	18	3	83.3
CBA2	319	14	28	9	67.9
CBA3	371	16	32	10	68.8
CBA4	502	16	32	19	40.6
CLS1	551	18	34	13	61.8
CLS2	425	18	36	12	66.7
CLS3	448	19	38	11	71.1
CLS4	698	22	44	11	75.0
HPERTE1	504	16	32	18	43.8
HPERTE2	462	20	38	14	63.2
HPERTE3	524	22	44	17	61.4
HPERTE4	867	27	54	20	63.0
SAH1	707	22	44	24	45.5
SAH2	506	21	42	20	52.4
SAH3	384	16	32	16	50.0
SAH4	446	14	28	12	57.1
Total	8002	290	576	229	60.7

A web survey using closed-end questions was conducted, with a total of eight questions. Subjects were asked about gender, year in school, college, awareness of UW-L UR (scale of 0 to 5), participation (if no participation, reason why), and perception of UR (descriptors were categorized as positive or negative). The survey was made using the free service at www.createonlineforms.com, and an introductory e-mail was sent out, explaining the project and giving the link to the survey. This e-mail also included and informed consent form. The Institutional Review Board approved this study. Non-respondents received a follow-up e-mail one week later, reminding them about the survey and asking them to complete the form. Six e-mail accounts were too full to accept the message. All of the surveys were fully completed, and only one respondent had to be removed due to inconsistent responses.

RESULTS

A total of 229 subjects participated in the survey, for a cooperation rate of 39.8%. The NR rate of approximately 60% was slightly higher than the predicted 50%. Estimates, standard errors (SE), variances, and 95% confidence intervals for the data are shown in Tables 3 through 8. The confidence intervals are indicated in parentheses after the point estimates in the following paragraphs, and we are 95% confident that the true value for each parameter lies within its corresponding interval.

The overall awareness mean was 1.48 (1.31, 1.65), and SAH had the highest college mean at 1.99 (1.65, 2.33). The lowest awareness averages by college were CBA and HPERTE, which were approximately equal at 1.18 (0.77, 1.60) and 1.14 (0.86, 1.42), respectively (See Table 2). These estimates were very close and the confidence intervals overlap, so it was difficult to determine which had the higher awareness. Juniors and seniors had the highest informedness among year in school, 1.91 (1.60, 2.22) and 1.85 (1.46, 2.223), respectively, with freshmen being the least informed at 0.82 (0.53, 1.11; See Table 3). Within the 16 strata, juniors in SAH had the highest awareness, 3.63 (2.98, 4.27), and freshmen in CLS had the lowest awareness, 0.62 (0.19, 1.04; See Table 4).

Table 2. Awareness by College

College	Estimate	Variance	Standard Error	95% CI
CBA	1.18	0.043415	0.208362	(0.77, 1.60)
CLS	1.58	0.031435	0.1773	(1.22, 1.93)
HPERTE	1.14	0.019255	0.138762	(0.96, 1.42)
SAH	1.99	0.029341	0.171292	(1.65, 2.33)

Table 3. Awareness by Year

Year	Estimate	Variance	Standard Error	95% CI
1	0.82	0.02103	0.145018	(0.53, 1.11)
2	1.3	0.025154	0.158599	(0.98, 1.62)
3	1.91	0.024048	0.155074	(1.60, 2.22)
4	1.85	0.036777	0.191773	(1.46, 2.23)

Table 4. Awareness by Strata

Strata	Estimate	Variance	Standard Error
CBA1	1	0.329861	0.574335
CBA2	1.56	0.27294	0.522437
CBA3	0.9	0.096223	0.310199
CBA4	1.26	0.106017	0.325603
CLS1	0.62	0.044295	0.210463
CLS2	0.92	0.036196	0.190252
CLS3	1.73	0.072554	0.269358
CLS4	2.64	0.219624	0.468641
HPERTE1	0.44	0.051821	0.227642
HPERTE2	1.14	0.07307	0.270314
HPERTE3	1.53	0.100438	0.31692
HPERTE4	1.3	0.067357	0.259532
SAH1	1.17	0.068837	0.262368
SAH2	1.6	0.093014	0.304983
SAH3	3.63	0.110807	0.332877
SAH4	2.33	0.240816	0.49073
Overall	1.48	0.007279	0.85316

The overall proportion of undergraduates who had performed UR was 0.12 (0.0, 0.17), with SAH and CLS having the highest proportions by college, 0.15 (0.07,0.23) and 0.16 (0.05, 0.27). HPERTE had the lowest proportion at 0.11 (0.04,0.18; See Table 5). By year in school, juniors and seniors had participated the most, 0.15 (0.06,0.24) and 0.18 (0.08, 0.29), respectively, and the freshmen had the fewest participants at 0.06 (0.003, 0.11; See Table 6). Four strata had means of 0, meaning that no one had performed UR (CBA, freshmen and juniors, and CLS, freshmen and sophomores). The two highest participation levels were found in CLS seniors and SAH juniors at 0.36 (0.06, 0.67) and 0.38 (0.13, 0.62), respectively (See Table 7).

Table 5. Participation by College

College	Estimate	Variance	Standard Error	95% CI
CBA	0.06	0.001137	0.033713	(0.77, 1.60)
CLS	0.16	0.003111	0.055777	(1.22, 1.93)
HPERTE	0.11	0.001339	0.036588	(0.96, 1.42)
SAH	0.15	0.001668	0.040837	(1.65, 2.33)

Table 6. Participation by Year

Year	Estimate	Variance	Standard Error	95% CI
1	0.06	0.000676	0.025994	(0.53, 1.11)
2	0.09	0.001541	0.039254	(0.98, 1.62)
3	0.15	0.002025	0.045	(1.60, 2.22)
4	0.18	0.002771	0.052642	(1.46, 2.23)

Table 7. Participation by Strata

Strata	Estimate	Variance	Standard Error
CBA1	0	0	0
CBA2	0.11	0.011997	0.109532
CBA3	0	0	0
CBA4	0.11	0.005034	0.070953
CLS1	0	0	0
CLS2	0	0	0
CLS3	0.18	0.014511	0.120461
CLS4	0.36	0.022776	0.150917
HPERTE1	0.17	0.007878	0.088759
HPERTE2	0.21	0.012559	0.112066
HPERTE3	0.06	0.003348	0.057861
HPERTE4	0.05	0.002442	0.04942
SAH1	0.04	0.001677	0.040953
SAH2	0.05	0.002401	0.049002
SAH3	0.38	0.014974	0.122368
SAH4	0.25	0.016587	0.12879
Overall	0.12	0.000438	0.021966

An estimated 79.5% (0.73, 0.86) of undergraduates had a positive perception of UR at UW-L, leaving 20.5% (0.14, 0.27) with negative perceptions. The “Other” option was assumed to be a no opinion response, and consequently was left out of this calculation. Approximately 25% of respondents chose “Other.” Freshmen, who were usually the least informed subgroup, tended to answer “other” to this question. We inferred that the lack of knowledge prevents them from forming an opinion, so “other” was considered “no opinion.”

DISCUSSION

Overall, student informedness was lower than anticipated. A large portion of UR is performed by students in SAH and CLS, which accounts for the high awareness averages in those particular colleges. In addition, awareness increased as students continued in their education. Freshmen are the least informed, and juniors and seniors had time to gain knowledge about UR through first-hand participation, professors, peers, and other means of exposure. Upperclassmen have also had more time to focus on their career goals and develop projects, so they had higher participation rates than the underclassmen. The majority of students surveyed had a positive perception of UR, which indicates more potential participants. Even with the lack of awareness among students, there appeared to be interest in performing UR.

One non-sampling error in our survey may have been the wording of the "why not?" question. The question did not specify whether the lack of knowledge option meant that a student did not have sufficient information about UR opportunities, or if the student did not feel he/she had the personal knowledge needed to actually perform UR. Other possible, but unlikely, non-sampling errors may have included data entry and calculation errors. These errors may have caused our data to be incorrect.

This project holds many possibilities for future research, including UW System-wide sampling in Wisconsin and other states, or even nationwide. The information gathered here is helpful in understanding how undergraduate research affects the UW-L campus, and may be useful to administration and faculty that are working to increase participation in UR at UW-L.

CONCLUSIONS

From this data, we concluded that much of the lack of participation is due to student uninformedness. Students do not participate, not because they think that UR is boring, tedious or a waste of time, but because the feel they lack knowledge. Whether this lack of knowledge is regarding the subject they would potentially investigate or regarding the UR opportunities, that is outside the scope of this study. The best way to improve student awareness regarding UR is to concentrate on the personal interactions between teachers, student researchers, and potential student researchers. Most students have a positive perception of UR and this needs to be utilized to the students' advantage. There must be a consorted effort to include undergraduates in research activities including, but not limited to: more student presentations (i.e. in an applicable class), having a research class option or major requirement, and more emphasis from professors. A UW System-wide survey of undergraduate students and faculty would give us insight into the awareness, participation, and perceptions of students state wide.